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A WILDERNESS MEETING:

WOLF PACK APPROACHES HUMAN HOWLERS

by Dick Dekker
3819-112A St., Edmonton, AB T6J 1K4

From 5 to 7 September 1970, Cedric Hitchon and I camped near a large montane meadow in the Snake Indian Valley of Jasper National Park. This meadow had been used as a rendezvous site by a pack of wolves in September 1969 (Carbyn 1975) and I had observed the pack there at that time. However, the location of the present homesite of the local pack was not known. We had neither seen nor heard any wolves during our two-day stay in the area. On our last morning we decided to hike out early as clear skies promised a hot day.

Around 6:30 am, having finished packing his gear, Cedric strolled over to the edge of the meadow to take a last look and to scan for deer and elk which we had spotted every morning and evening. He came back in a hurry, exclaiming that he had just seen a wolf, the first one of his life! The animal had been visible only for a few second before disappearing into cover on the opposite side of the meadow. Thinking that other wolves might be following, we rushed to the meadow and glassed the area carefully, but no wolves showed up. However, the one Cedric had seen couldn't be far away. In the hope of getting an answer, I imitated a howl, and scarcely a minute later something stirred on the far side of the meadow about 800 metres away. Through the binoculars we saw four wolves file out of the forest: two were light grey, one was black, and the last a mixture of both, a grizzled silver. The animals paused and looked our direction. Then one of the greys and the black proceeded to cross the meadow directly toward us.

While the silvery wolf remained where it was and lay down, the second grey wolf approached by walking along the other side of the meadow. When it was directly opposite us, about 200 metres away, it studied us for some time, then moved off in the woods, leaving us with the disturbing notion that it intended to stalk us and sneak up from behind. The other wolves had continued directly towards us, but they did not hurry and paused on a slight rise about 120 metres from us.

The dark wolf was a third smaller than its companion and likely only half its weight. Except for pale gold eyes and a grizzled muzzle, it was uniformly black. The grey wolf was heavily built, presumably weighing well over a hundred pounds as these Rocky Mountain wolves are among the largest subspecies of *Canus lupus* and average thirty to forty pounds heavier than eastern Canadian wolves (Mech 1970). His luxurious fur varied in colour from creamy white flanks, belly and throat to dark grey along the spine and chestnut on the black-tipped tail. His facial pattern of grey and yellowish-white formed a striking mask. The eyes were amber. The wolves glanced at us casually, as if we had ceased to be of interest. Perhaps they were mystified by our immobility and waiting for a signal that would identify us and announce our intentions. We didn't move and made no sound, absorbing the magic of this meeting.

In the meantime, the sun had risen over the rim of mountains to the east, and beams of light crept out over the uneven surface of the meadow, setting a million stars alight on the frost that coated every sprig and blade of grass. When the wolves were illuminated by the light, they stood out vividly against shadowed spruces,

like jewels on velvet. The setting was perfect when a distant howl rose and fell. To our delight the two animals in front of us responded. The smaller black wolf, probably a female, howled in a higher voice than the big grey male. Also, the silver-coloured animal which had stayed behind and now chimed in had a voice of a high pitch, especially in comparison to the wolf that had sounded far away. We wondered about that howl. It had not been the second grey wolf, the one we thought might be sneaking around us, for he had reappeared on the meadow and trotted up to join the two others. The three of them howled at intervals.

Presently the chorus stopped and one of the grey wolves began to walk in our direction, fixing us in a direct stare. We couldn't help feeling uneasy and glanced about for a tree to climb, but before the situation became critical, a hoarse call summoned our attention to the far end of the meadow. Just visible between the trees stood a great lanky wolf, dark grey with black legs and head. I recognized him as the dominant or alpha male of the pack seen here last year. Probably he had come to get his straying companions. The three wolves immediately lost interest in us and trotted across the meadow. Together with the silver animal, they fell in line with the two-toned leader, and within minutes all were gone from sight.

Human simulations of wolf howls have been used by many field researchers to elicit howling responses from wolves and to locate wolf activity in areas in forested habitats during summer (e.g. Pimlott 1960; Harrington and Mech 1979). Single wolves or pairs sometimes approached the researchers when they howled in proximity to occupied wolf dens and rendezvous sites (e.g. Joslin 1966; Dekker *in press*). Harrington and Mech (1979) were approached by single wolves and pairs in locations away from homesites. To my knowledge there are no published accounts of wolf packs approaching human howlers in situations near homesites or away from them. Therefore, the above observation seems noteworthy.

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ERRATA. In "Exotic Pets in Alberta" by Dale Hampshire (AN 13(2)) the missing reference, Taylor (1983) that completes the raccoon dog episode is: Taylor, R. 1983. Racoon Dogs: an environmental story with a happy ending. Trail and Landscape 17(2): 48-50 (Ottawa Field Naturalists' Club). In addition, Song Sparrow should read *Melospiza melodia*; Eastern-spotted Newt should be Eastern Newt, and *Notophthalmus viridescens*; Spiny mice are in the genus *Acomys*, not *Perognathus spinatus*.

THE LITTLE BROWN BAT [1].

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Generally speaking, there are very few people who do not know what a bat is. From our earliest memories bats are something associated with witches, sorcery, demons and other unpleasant phenomena. Most everyone, if shown a picture or silhouette of a bat, could recognize it as a bat. Much in the same way people can distinguish birds from other animals. Even though there is this "familiarity" with bats, very few people know much about them or even care to know much about them.

In Alberta, if a person has had an opportunity to see a bat, the probability is extremely high that the bat they see is a Little Brown Bat. This bat frequently occupies buildings or associates around buildings that house people. Hence, the opportunity of observing or encountering this bat is extremely good.

The scientific name for the Little Brown Bat is *Myotis lucifugus*, a name that is not very descriptive of this animal as *Myotis* means "mouse ear" and *lucifugus* means "fleeing flight". *Myotis lucifugus* belongs to the family Vespertilionidae in the Order Chiroptera. Chiroptera is the scientific name for that group of animals collectively known as bats. Over 900 species of bats are known throughout the world. This Order is exceeded in diversity of species only by the rodents. Within the Order Chiroptera, the Family Vespertilionidae contains more species than any other bat Family, and members of this Family are found throughout much of the world. Vespertilionid bats are mainly insectivorous. All the bats that have been reported from Alberta belong to this Family.

DESCRIPTION

The name Little Brown Bat aptly describes this bat. It is a relatively small brown bat. The colour of the fur varies from light brown to dark, almost mahogany, brown. The ears and flight membranes are variable as well and may be greyish-brown to almost black. The total length measurement of a large series of these bats varies between 80 and 107 mm with a forearm measurement of between 34 and 42 mm. Weights of individuals vary with the season. They are lightest in the spring and heaviest in the fall just as they enter hibernation. Weights vary between 8 and 12 grams. Females are, on average, larger than males.

DISTRIBUTION

Little Brown Bats have been found throughout the Province. Museum specimens have been collected in Wood Buffalo National Park in the north, along the Milk River in the south, from Jasper National Park in the west, to Chauvin and Schuler in the east. The highest concentration of this species occurs in the parkland area of the Province where old buildings and permanent water frequently occur together.

1. Natural History Contribution 73.

Three subspecies of Little Brown Bats have been reported for Alberta. *Myotis lucifugus carissima* occurs in southern Alberta. This subspecies is paler in colour and is slightly smaller in size than the more widely-distributed *M. lucifigus lucifugus*.

M. lucifugus lucifugus is the most widely-distributed subspecies, occurring throughout most of the Province. It is a medium-sized, brown bat. The fur of this bat can vary from a reddish-brown to a dark, almost mahogany brown.

M. lucifugus pernox is restricted to the northern mountain areas, essentially in the Hinton-Jasper area. Very little is known about this subspecies, It is darker in colour and slightly larger than *M. lucifugus lucifugus*.

REPRODUCTION

Essentially the breeding cycle begins when the summer nursery colonies break up. The mature females leave the colony first leaving the young of the year to disperse on their own. One of the unknowns about the biology of Little Brown Bats in Alberta is the destination of these dispersing bats. It is known that these bats do not occupy their nursery colonies during the winter, but where the majority of bats spend the winter is unknown. There is a slight hint that they may move in a southwesterly direction. This is on the basis of the recovery of two banded bats that had moved in such a direction after banding. Until more information is received to confirm this, it will remain a mystery.

From studies done in other areas of North America, hibernacula sites not only serve as places where bats spend the winter but also as sites where mating occurs. It is believed that the same occurs here in Alberta. At one known hibernaculum the majority of the bats found there are males; however, during late August to mid-September the number of females and young of the year increase substantially. No mating behaviour has been observed at this site but it is a place where males and females congregate.

Again, referring to studies done in other areas, once mating has taken place the bats enter hibernation. The female stores the sperm in her body over winter, and it is not until the following spring that ovulation and fertilization takes place. The gestation period is believed to be 50 to 60 days.

The winter months, September to mid-April, are spent in hibernation. The hibernaculum is located in a cave or abandoned mine shaft. In Alberta there are only three known areas where bats hibernate. The population of these hibernacula is not large enough to account for the summer population of Little Brown Bats in Alberta. However, it is not known where the remaining bats spend the winter.

Hibernation is a critical time for bats. At this time they are in a very deep sleep; all body functions slow down and they are vulnerable to predation and, especially, to disturbance by people. During this period they have no way of escaping. The environment of the hibernaculum is crucial. It must have the proper humidity and temperature. If too dry, the bats will become dehydrated; if too warm their body temperature is not low enough and they expend their reserves of body fat too rapidly; if too cold they could freeze to death. Another critical factor in the survival of bats during the winter is the amount of fat they have accumulated. If they are not fat enough or if they get disturbed too frequently their fat reserves can become depleted and they will die.

By mid-April the females begin to leave their winter roosts. At this time of year the weather has become mild enough so that the supply of insects is sufficient to sustain the bats. These female bats seek out places for nursery colonies. How such

places are found is not known, but it appears once a place has been found it will be used in subsequent years. Some criteria that seem to be necessary for a nursery colony are: a dark, warm attic that is near a water supply. Many buildings in the Parkland region of Alberta seem to meet these requirements as this is the area of the Province with the highest concentration of these bats. At this time the nursery colony is composed entirely of females both pregnant and non-pregnant.

Parturition time is frequently synchronized in a colony. This may occur from mid-June to mid-July. During delivery the young are born by breach delivery. The normal resting position of bats is with their head hanging down. However, during delivery the female reverses her position so that the tail membranes can be used to hold the newborn. Shortly after delivery the young bat crawls up the mother's body and attaches to a nipple.

The young can remain attached while their mother flies, but it has not been established whether the young is attached while the mother is out feeding. One young is produced per year with approximately the same number of males and females being born.

The young are relatively well-developed at birth. Although their eyes are sealed at birth, they open by the second day. The young are capable of flight at about three weeks of age and are able to hunt for themselves at about one month. Shortly after the young are able to hunt for themselves the adult females leave the colony and the cycle is completed.

The life expectancy of Little Brown Bats is about eight years, but some exceptionally long-lived individuals have been reported. For example, a bat banded as a young of the year was recaptured 30 years later.

ECHO-LOCATION

Possibly one of the more intriguing aspects of bat biology is the ability of bats to find food and avoid objects under very restricted light levels. It was only with the development of sophisticated sound detection equipment after World War II that extensive studies of bat echo-location became possible.

The basis of echo-location depends on the production of high frequency sounds and the detection of these sounds. It has been known for a long time that hearing is important to bats to find their way in the dark, but it was not until high frequency sound detecting equipment became available that the importance of vocalization was realized. When flying a bat emits high frequency sound waves and when these sound waves strike an object, an obstacle or a food item, a return sound wave is generated. This returning sound wave has been termed an "echo". When the bat hears this echo its brain determines whether it should avoid the object or chase the food item.

By analyzing bat vocalizations, it has been found that bats produce several different sounds. One is for searching, another is for chasing when a food item is detected. It has also been determined that some moths, upon which bats prey, are able to detect the bat's hunting and chase signals and avoid capture.

Echo-location or "bio-sonar" is used by many different species of bats. It is not believed, however, that bats use this system for navigation. How bats find their way from their summer roosting colonies to their winter sleeping areas is not known, but there is some suggestion that they use visual cues. The expression "blind as a bat" is not correct. Bats are not blind, in fact some species depend on their eyes to

find food and avoid obstacles and have not developed an echo-location system. What role vision does play in those bats that do echo-locate awaits investigation.

Although this section on echo-location has been of a general nature, most of the early work involved Little Brown Bats; hence, much of what is known about echo-location refers to the Little Brown Bat.

FOOD

No one has studied the dietary habits of Little Brown Bats in Alberta. In other areas of North America it is known that they feed exclusively on insects and that they consume large quantities of these animals. There is no reason to suspect that the bats found here are any different. Beetles, moths and flies are all included in the diet of these bats.

Food items are detected by echo-locating. A prey item is captured in either the wing tip or the tail membrane and then passed to the mouth. If an insect is not too large it is consumed while the bat is flying, but if too large the bat will land to eat it. It has been estimated that Little Brown Bats can capture prey at the rate of one insect every seven seconds. It has also been shown that not every pursuit by these bats is successful.

BATS AND PEOPLE

Even though most people are not very interested in bats, understanding bat biology is important. Some bats occupy buildings that house people. Therefore, it is important that some understanding of the diseases and parasites of these bats become known so that it can be determined if there is any danger to people. A case in point is the incidence of rabies in a bat population. It is known that some species of bats have a relatively high incidence of rabies. If bats with rabies come in contact with bats that are occupying houses there is a potential hazard to the people living in those houses.

Bats occupying houses also constitute a nuisance to people. Because bats eat large quantities of insects and a large number of bats can occupy a roost, the accumulation of bat droppings can be enormous. Such accumulations cause odor problems to the house occupants. As well, the noise caused by the bats is annoying.

Bats are hosts to a number of ectoparasites. Fleas, mites, lice and bugs have all been reported to be parasites of bats. Although unpleasant, these parasites are not known to be harmful to people.

Because house bats are pests, severe control measures are frequently employed to rid the houses of bats. These measures usually cause the deaths of hundreds of these animals annually and seldom solve the pest problem. The only effective way to control bats in a building is to restrict entry to the building. Bats can find the smallest opening and use it once they have decided to occupy a house. It is therefore imperative for anyone who is serious about getting rid of bats that they seal all holes. Such things as moth balls and other odor-producing substances to get rid of bats are not effective.

A question may be asked "What good are bats?" "Why not get rid of them all?" Because bats consume large quantities of insects, they are beneficial to the entire ecological scheme. The important thing with respect to bats is to keep them away from people and they do not become the problem that people consider them to be. Even though

many people could care less about bats, our world would be a less interesting place without them. Measures to conserve our bat populations are just as important as measures to conserve our fish, our birds or our game animals.

LITERATURE SOURCES

In this paper I have not given literature citations where they should be acknowledged. The literature on Little Brown Bats is extensive and I have extracted my information from a large number of sources. Very little is from personal research. I am including in this section a partial list of available literature. Anyone who is interested in pursuing this subject further should consult these works and the citation listed therein.

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THE IMPORTANCE OF WILDLIFE TO CANADIANS:
HIGHLIGHTS OF THE NATIONAL SURVEY

A comprehensive survey conducted by Statistics Canada in 1982 and sponsored by federal, provincial and territorial government wildlife agencies and a number of non-government groups (including FAN) revealed that Canadian wildlife resources were highly valuable to the nation. The study, which questioned approximately 100,000 Canadians from all regions and walks of life, gauged the importance of wildlife through questions on attitudes toward wildlife populations, participation in a number of wildlife-related activities and related expenditures in 1981.

Wildlife-related activities emerged as one of the most prevalent forms of recreation undertaken by Canadians. In 1981, the majority of the Canadian population 15 years of age and over was involved in some form of wildlife-related activities. 83.8% of the surveyed population participated in some form of indirect wildlife-related activity (watching films or television programmes, 76.8%; reading about wildlife, 48.6%; visiting a zoo, aquarium or museum of natural history, 42.6%; purchase of arts, crafts and posters of wildlife, 15.9%; belonging to wildlife organizations, 6.0%). 66.8% participated in non-consumptive activities around the residence including feeding (40.1%), watching wildlife (53.5%), purchasing feed for wildlife (20.4%), studying wildlife (19.5%), photographing wildlife (17.1%), and maintaining plants for wildlife (13.4%). Primary non-consumptive wildlife-related trips were taken by about 19.4% of the population surveyed. During these trips 16.3% watched wildlife, 7.4% photographed wildlife, 6.0% studied wildlife, and 5.6% fed wildlife. 43.9% of the Canadian population encountered wildlife incidentally while on outings or trips taken for business or pleasure. Interestingly, only about 9.8% of the surveyed population hunted in 1981, and about 32.1% reported having had some hunting experience at some time during their lives. New Brunswick and Newfoundland had the highest per cent of hunters, with 20.0% and 19.9%, respectively. Ontario had the fewest, with 7.3%. Alberta was slightly above the national average, 9.8%, with 11.4% of the surveyed population in Alberta participating in hunting during 1981.

An estimated $4.2 billion was spent in 1981 by Canadians on wildlife-related activities. The average yearly expenditure per participant was as follows: wildlife organizations, $107; maintaining natural areas, $455; residential activity, $16; primary non-consumptive trips, $589; incidental encounters on other trips, $10; and all game hunting, $662. As these figures show, contrary to often-stated opinions, hunting is *not* the primary economic consideration when it comes to wildlife.

During 1981, Canadians spent an average of 61.2 days in residential wildlife-related activity, 15.8 days on primary non-consumptive trips, 17.9 days hunting, and incidental encounters of wildlife on other trips occurred on 18.8 days.

Especially encouraging were Canadians' attitudes toward wildlife. About 80% indicated they felt it was very or fairly important to maintain abundant wildlife. 82% of respondents felt it was very or fairly important to preserve endangered species. 82.8% of Canadians expressed some or great interest in participating in non-consumptive wildlife-related activities, and 26.9% indicated some or great interest in participating in consumptive wildlife-related activities. Although only 6.0% of those surveyed indicated they participated in some form of wildlife-related organization, 43.4% (52.3% of Albertans) indicated some or great interest in participating in a wildlife-related organization. The obvious differential between actual participation and

expressed interest suggests a large pool of potential participants for this form of wildlife-related activity. The report concludes membership in wildlife-related organizations could possibly be increased by as much as 600%! - Editor

INTERBASIN TRANSFER IN ALBERTA: MYSTIQUE AND REALITY

by John H. Eisenhauer
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Perceptions of prairie landscapes are often molded by water. During our brief recorded history on the Canadian plains the lack of water has frequently been mentioned as a factor limiting settlement. The now famous Palliser Triangle, which includes much of the arid prairie region in Canada, was considered by Captain Palliser to contain large tracts of land "comparatively useless" for agriculture (MacEwan 1969). Palliser's assessment is most often assumed to be based solely on water availability, but Palliser also considered soils and other factors. Today, a century following this assessment, large areas of land in the Palliser Triangle remain virtually untouched by modern agricultural management and technology. But one million acres of the southern portion of the Palliser Triangle in Alberta has become one of Canada's most intensively-farmed regions. These are the irrigated food lands of the South Saskatchewan River Basin.

Irrigation is directly responsible for the social and economic welfare of many communities in southern Alberta. Some 6,000 farmers irrigating lands in the Oldman, Bow and Red Deer River Basins produce over 20 per cent of the annual agricultural production in the Province (Francis 1979). This irrigated area is the wealthiest farming region on the Canadian plains.

Interbasin transfer of water from Arctic to southern watersheds for large-scale expansion of irrigated acreage is a politically-powerful and deep-seated idea in Alberta. Advocates of interbasin transfer for irrigation consistently ignore one critical aspect of transfer schemes - their costs to the provincial taxpayer. Costs to today's taxpayer which may exceed $28 billion; that's $12,000 for every Albertans. With these staggering costs, why has large scale expansion of irrigated acreage through interbasin water transfer received political support for more than two decades? The answer is found in the belief that irrigation can bring tremendous benefits to the social and economic fabric of Alberta. Unchallenged, this belief could commit Alberta's future to a single development strategy. These expensive irrigation systems will cost billions of dollars in public funds to develop, maintain and eventually replace.

A plan to transfer huge volumes of water from Alberta's Arctic watershed to dry land farming areas in the south began as an inventory of provincial water supplies in the 1960's. Called the Prairie River Improvement, Management and Evaluation, or PRIME plan, this inventory was developed on the premise that water supplies in southern Alberta may not meet future requirements (Bailey 1967). Promoted as a blueprint for water resources development, PRIME proposed a series of major dam sites and diversion canals to deliver water southward when required. The plan was developed to support irrigation, the only possible water requirements large enough to "justify" the plan. Later, PRIME was expanded and incorporated into a federal-provincial engineering study of water supplies and estimates of future requirements in the Saskatchewan-Nelson River Basins (Saskatchewan-Nelson Basin Board 1972).

During the late 1960's, Alberta's water resource engineers actively promoted the PRIME concept. Large relief maps showing dam sites and diversion canals and the distribution of provincial water supplies were prominently displayed by water resource personnel as they toured the Province. Initially the public were receptive to PRIME, but became concerned with rumours that Canada's water was for sale. Many Albertans questioned the apparent similarities between PRIME and a host of water export schemes being advocated by American engineering companies. Why did the huge water diversion canals in the PRIME proposal end near the Alberta/U.S. border? Irresponsibly, environmental groups, and later the Progressive Conservative Opposition in the Alberta legislature, began calling PRIME a water export scheme. PRIME quickly became an election issue in 1971 as the Progressive Conservative Party campaigned on a platform to "...conduct all river basin management studies and contemplated programs independent of, and without influence from, some pre-conceived massive diversion program such as the one called PRIME" (Alberta Progressive Conservative Party). The political catch phrase "PRIME is a Crime" soon appeared on bumper stickers throughout the Province.

The Progressive Conservatives formed the government following the 1971 election and two elements of the PRIME plan were immediately dropped. The first of these was the name PRIME, and the second was any public reference to interbasin water diversion in the location of proposed dam sites. Contrary to specific instructions provided by the new Environment Minister, Bill Yurko (Alberta Environment 1975), and in contravention of public policy (Alberta Hansard 1972), Alberta's water resource engineers continued to implement PRIME following the election. Dam sites proposed after 1971, such as the Dickson Dam on the Red Deer River and the Three Rivers Dam on the Oldman River, were "...being located such that they will 'fit', be effective and serve as part of the eventual concept of inter basin transfers of water..." according to senior water resource engineers (Melnychuk 1979).

On October 25, 1979, Peter G. Melnychuk, Assistant Deputy Minister with Alberta Environment, described a phased approach to water transfer in a confidential memo. His description of a series of 12 dam sites and 11 diversion canals corresponded to the expanded PRIME scheme incorporated in the Saskatchewan-Nelson Basin study. Information in Melnychuk's secret memo was used by the Honourable Henry Kroeger, Minister of Transportation, during a speech on November 15, 1979. The speech, a carefully staged media event, was delivered at a water conference in Red Deer sponsored by the Alberta Chamber of Commerce. An enthusiastic audience of irrigation lobbyists, engineering consultants, cement company representatives, and others greeted the Minister's remarks with a standing ovation. The audience howled with laughter when Kroeger stated "...if I'm scaring some environmentalists here, it isn't by accident" (Kroeger 1979). Transport Minister Kroeger indicated during the speech that he had strong political support within the Cabinet for interbasin transfer and had formed a committee to 'study' the issue. During the following months, membership in Kroeger's newly-formed Water Advisory Committee was radically changed to provide the appearance of a more balanced review of water management policy. As originally proposed, the Committee consisted mainly of engineering consultants who specialized in dam site engineering and related activities. Later, Kroeger attracted several well known individuals and 'personalities' to act as Committee members. The Committee's report to the Premier was "leaked" to the media in November 1981. Much of the poorly-written report was based solely on opinion and speculation with a blatant disregard of factual information and historical accuracy. Predictably, the Committee's key recommendation was that a comprehensive interbasin transfer plan be developed to expand irrigation acreage by millions of acres (Water Advisory Committee 1981). Although the report was signed by the whole Committee, some members expressed surprise at the report's recommendations when approached by the media, apparently some Committee members were unaware of the report's contents.

The rational for the Water Advisory Committee's interbasin transfer recommendation

was based on increasing agricultural production through irrigation to meet projected world food demands. Production of gasohol from grain as a future fuel was also discussed at length in the report. No attempt was made by the Committee to estimate taxpayer costs. However, cost estimates of the preferred interbasin transfer option outlined by Peter Melnychuk, and the costs of developing the eight million acres of land with irrigation potential identified by the Committee, have been made. Dr. Dixon Thompson with the Faculty of Environmental Design at the University of Calgary estimates the capital costs of Melnychuk's proposed dam sites and diversion canals could reasonably exceed $16 billion (Thompson 1982). This cost estimate results from a conversion of costs established earlier in the Saskatchewan-Nelson study to current dollars and construction projections. These escalating construction costs, which greatly exceed increases in crop prices, are signaling the end of irrigation-based reservoir development. Maintenance costs of the transfer system are estimated by Thompson (1982) at some $563 million per year. These important cost estimates should have been developed by public servants with Alberta Environment and Agriculture working as "advisors" to the Committee and included in the Committee's report.

The costs of developing the extensive canal network necessary to deliver water to individual farms in the eight million acre area identified by the Committee are more difficult to assess. Current cost estimates for construction of water delivery canals usually exceed $50,000 per kilometer (Ross 1982). Thousands of kilometers of major and secondary canals are needed to service eight million irrigated acres. A study commissioned by the Federal government in 1956, and used more recently by Alberta Environment, estimated costs of developing 100,000 acres of irrigation over 20 years at some $780 per acre (Maierhofer 1956). Twenty-six years later these costs have easily doubled, exceeding $1,560 an acre. This yields a crude, but conservative, cost estimate of some $12.5 billion for the development of eight million irrigated acres.[1] Thus, the total cost of moving water from northern river basins to southern Alberta to service vastly expanding irrigated acreage can be conservatively estimated at some $28 billion, a figure which is near the present Canadian National Debt.

The major taxpayer costs of irrigation development occur early in the life of a project. Full economic returns are realized years, even decades, following project completion.[2] In addition, the millions of acres documented as having irrigation potential by public servants often do not reflect realities farmers must face. Most farmers use irrigation only on a small portion of their holdings to supplement dry land agricultural production. Financial and manpower limitations usually make additional irrigation impractical. Yet, these realities are rarely reflected in government planning documents and public statements by officials that promote millions of acres with irrigation potential. Changing provincial government spending priorities, variations in markets and crop prices, soil conditions, and adequate natural precipitation have also constrained irrigation development in the past. Considering these factors, why has

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1. C.R. Maierhofer's calculations are adjusted to the 1975 Consumer Price Index and include a per acre cost for water storage of $600 (1975) which remains in the total cost estimate to account for unanticipated costs identified by the author and others. In general, Maierhofer found irrigation development costs increasing over 260% of anticipated costs in 20 years.

2. Historical irrigated farm development rates in the U.S. are as follows: years after completion, 5, area irrigated, 36%; y.a.c. 10, a.i. 58%; y.a.c. 20, a.i. 68%; y.a.c. 30, a.i. 82%; y.a.c. 40, a.i. 85%; y.a.c. 50, a.i. 86%. This slow rate of development has parallels in Alberta which dramatically alter the economic "benefits" of irrigation projects. Such information is rarely high-lighted in government publications promoting irrigation of dam construction.

interbasin water transfer for large scale irrigation expansion remained a politically powerful idea in Alberta?

The Water Advisory Committee must have considered that investments of this magnitude in irrigation would bring widespread benefits to the Provincial economy. It has been the practice in Alberta since 1975 to commit large expenditures from the Heritage Savings Trust Fund (HSTF) to irrigation expansion. The rationale for this investment, simply put - and it's rarely put otherwise - is that Provincial revenues from non-renewable resources should be used to develop irrigation agriculture, a renewable resource[1]. But, the HSTF is the property of all Albertans, and major investments from the Fund should, at the very least, bring widespread economic and social returns to the Province. Unfortunately, the benefits of irrigation development may not be as widespread as previously thought. Some Alberta agricultural economists such as Dr. Terry Veeman at the University of Alberta, are of the opinion that "...irrigated agriculture on the prairies, given current and prospective crop mixes, is only a marginal economic activity in terms of social and economic returns and costs" (Veeman 1980). Recent commitments by the Alberta taxpayer of some $375 million to irrigation are expected to distribute 81% of the net economic benefits to the local region with fewer than 3,500 farmers receiving more than one-half of these benefits. The remaining 19% of the net economic benefits of this investment are distributed beyond the local region in Canada and elsewhere (Marv. Anderson and Associates Ltd. 1978).

Cropping patterns on newly-irrigated acres are expected to follow the existing crop mix. Approximately 65% of the irrigated land in Alberta is devoted to the production of relatively low-valued livestock forage crops. These crops are expected to perform relatively poorly in the long term according to future market projections (Alberta Agriculture 1978). Higher-valued specialty crops, such as sugar beets, potatoes and other vegetables, comprise only 10% of our irrigated agricultural production and are limited by current and projected markets, available storage technology and international agreements. Sugar beets are the major specialty crop in southern Alberta, and our competitive disadvantage in the production of sugar has seen the recent closure of processing facilities. Other crops grown on irrigated lands, such as wheat, barley and oilseeds, are commonly produced on dry land farms across the Canadian prairies.

Irrigation dramatically increases agricultural production per acre and gross economic returns to the individual farmer. But, the Water Advisory Committee's comparisons of the gross value of agricultural production between dryland and irrigated acreage are questionable. Using the gross value of production as a comparison ignores the high energy and other costs of operation the irrigation farmer must pay. Comparison of the net returns of irrigation and dryland agriculture can provide a more accurate picture. The gross values of irrigated production presented to the public by Alberta Agriculture and others also rarely consider the large and continuous outlays of public funds that make irrigation possible.

Another reason for the support of interbasin transfer by the Water Advisory Committee may relate to the impression that water flowing out of the Province is somehow wasted. The argument is often used that water drains from Alberta's eastern slopes too

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1. This film states that irrigation returns $3 to the public purse for every dollar invested, a figure that is so ridiculous that it borders on an abuse of the public trust. The film also discusses the Oldman River dam controversy which disrupted communities in southern Alberta for more than five years. The damsite is depicted as flooding the barren river landscape east of Lethbridge, rather than the Three Rivers site promoted by Alberta Environment which will destroy 22 farmsteads, an outstanding wild trout fishery, superb whitewater rapids and some of the most magnificent river scenes in the Province.

quickly and must be held back in storage reservoirs for later use. Water stored in these reservoirs can then be managed for our economic and social welfare. This simplistic argument seems compelling, but how do we manage and use water stored in irrigation reservoirs today?

Irrigation consumes more water than all other uses in Alberta combined. However, much of the water consumed by irrigation districts is not available for use on farms. Most of Alberta's larger irrigation districts use less than 30% of their water withdrawals for crop production (Oldman River Management Committee 1978). The remaining water supplies are lost mainly through inefficient delivery canals or returned unused to the watershed as downstream flow. Water lost or wasted amounts to 30% or more of the annual withdrawals in the larger districts. Delivery canals in these districts were constructed many decades ago and are dilapidated today. Maintenance of these canals until very recently, and then only with large public subsidies, has been substandard or nonexistent. District farmers have simply been unwilling to pay the costs. In the Lethbridge Northern Irrigation District, for example, 47% of the major secondary canals and 71% of the minor canals were identified as needing replacement in 1976 (Alberta Environment 1976). Improving these water use efficiencies would considerably increase water available for irrigation use. Alberta's second largest district, the St. Mary River Irrigation District, has estimated that an increase of 10% in its water use efficiency would provide water for an additional 100,000 acres. Even with this increase in efficiency, the district would be well behind irrigation systems in the western United States which average over 50% efficiency of water use (ECA 1979).

Land lost to agricultural production is a second major consequence of inefficient water use. Some 200,000 acres are effected by salt accumulation and seepage as a result of poor irrigation management in Alberta (Stanley/LN Consulting 1978). Irrigation consultants estimate that costs of rehabilitating water delivery systems, reclaiming soils, providing adequate drainage and modernizing the existing system exceed $500 million. The need for addressing these problems has been recognized since the early days of irrigation in Alberta (Burchill 1949). Yet, the Water Advisory Committee's Report makes no mention of these constraints to existing and future irrigation developments.

Today, irrigation provides a large measure of economic and social stability in a region of our Province with limited alternatives. Viewed as an instrument of social policy, irrigation has been successful, but the taxpayer costs of blindly implementing this policy in the past, today and in the future are very high. At present, Alberta's irrigated area is one of the wealthiest farming regions in Canada. Future investment in the irrigation resource must be more carefully balanced by social and economic considerations elsewhere in the Province. Our preoccupation with the expansion of irrigation at the expense of existing irrigation systems can only place the resource in future jeopardy.

It is clear that the availability of taxpayer dollars, not water, is the major constraint to the maintenance, rehabilitation, expansion and eventual necessary replacement of irrigation systems in Alberta. Advocating the development of millions of new acres of irrigation may leave this and future generations with expectations and commitments they cannot possibly realize. The choice is ours.

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GYRFALCON SIGHTINGS AT BEAVERHILL LAKE AND EDMONTON, ALBERTA 1964-1983

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Gyrfalcons *(Falco rusticolus)* breed in arctic and subarctic regions. In Alberta, they are seen "mainly in late fall and winter when young birds wander widely before returning in spring" (Salt and Salt 1976). Godfrey (1966) stated that the species "wanders south of the breeding range in winter". During late fall and winter, Gyrfalcons are regularly recorded in the Calgary area (Dekker 1977).

This note gives information on 9 Gyrfalcon sightings at Beaverhill Lake, Alberta, where I went birdwatching on 464 days from September to December and on 215 days in March and April, 1964-1983, and on 3 sightings at the city of Edmonton.

The Beaverhill sightings are dated as follows: 14 April, 25 and 27 September, 29 and 31 October, 4 and 6 November, and 26 December. Three of the falcons were seen to attack potential prey: ducks, a gull and a plover.

I observed Gyrfalcons in Edmonton on 24 December, and 10 and 18 January. Two of these falcons made aborted attacks on feral pigeons.

In most cases I had only a brief view of the falcons, but sufficient for positive identification. The most memorable sighting, on 25 September 1976, involved a Gyr which alighted on a fence post a dozen metres from a Peregrine Falcon *(Falco peregrinus)* I had been watching. The Peregrine took off at the Gyr's arrival, flew a half circle as if to look it over and returned to its post. Both birds gave me an opportunity to approach slowly with the scope for a better look, before they flew away and began to soar, drifting southward.

The early fall dates reported here are of interest, since the handbooks emphasize late fall and winter as the time when Gyrfalcons wander south. Especially during September and early October any large falcon sighted in central Alberta should be identified with care. Gyrfalcons of the slate-grey and brownish-grey colour phases closely resemble Peregrines and Prairie Falcons *(Falco mexicanus)*, which also occur at Beaverhill Lake at that time (Dekker 1979, 1983).

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CONCERN FOR BULL TROUT

by Liz Stinson
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At its regular quarterly meeting on May 21, 1983, the Board of Directors of F.A.N. unanimously passed a motion supporting a resolution by Trout Unlimited and the Alberta Fish and Game Association on behalf of the Bull Trout, *Salvelinus confluentus*. The Fish and Game Association, on the recommendation of Trout Unlimited, has asked the Associate Minister of Fish and Wildlife to reduce the catch and possession limits for this species and to encourage catch-and-release (ie. non-consumptive) fishing. This request is being made because in many parts of its range in Alberta, particularly the streams of the eastern slopes, this species has recently experienced a severe decline in numbers. Habitat destruction or alteration and competition from introduced species play only a small role in this decline. The major factor is overfishing in those areas offering relatively easy access to fishermen.

The Bull Trout was formerly considered to be a conspecific of the Dolly Varden char, *Salvelinus malma*. However, differences in mouth structures associated with feeding are sufficient that the two are considered separate species. As such, the Bull Trout replaces Dolly Varden as one of Alberta's two native species of char (the other being Lake Trout, *Salvelinus namaycush*). A third species, the Brook Trout, *Salvelinus fontinalis*, has been introduced to lakes and streams in this Province but is native to eastern North America (Scott and Crossman 1973).

Bull Trout (and Dolly Varden) are olive-green on the dorsal (back) surface, occasionally with lighter spots or vermiculations superimposed on the dark background. This dark surface fades to silvery on the sides where yellow, orange or red dots occur. Breeding males may be orange or red on the lower sides and belly (Paetz and Nelson 1970).

The idea of catch-and-release fishing may be new to many people. The intent, as the name suggests, is to enjoy all the benefits of fishing but one. Fishermen practicing this technique have the pleasure of being outdoors, by a quiet lake or stream, in the company of friends guessing where the fish are. However, having caught a fish they release it as carefully as possible rather than taking it home. This can be done with little additional effort than that expended in traditional fishing. Barbless hooks are recommended as they are more easily removed from the fish's mouth and consequently do less damage to mouth tissue. When the fish is to be released, it should be placed in a bucket (in the shade) or held loosely in the stream or lake until it shows signs of resuming normal behaviours (gill cover movement slows, tail begins flapping, et cetera). At that point the fish can be released to the area from which it was caught. Care should be taken to minimize handling of the fish as contact may remove some of the protective mucous layer on the skin surface.

Bull Trout are known to be gullible fish, that is, they are relatively easy to catch. Thus, populations in popular areas are particularly susceptible to overharvesting. Reduction of limits and catch-and-release fishing for this species are strongly recommended. This is the stance adopted by Trout Unlimited and the Alberta Fish and Game Association, and endorsed by the Federation of Alberta Naturalists.

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EXOTIC PETS IN ALBERTA - UPDATE

After reading Dale A. Hampshire's article in the Alberta Naturalist 13(2), Mr. John B. Heppes, Administrator of C.I.T.E.S. (the Convention on International Trade in Endangered Species) for the Canadian Wildlife Service, has supplied the following information:

(1) None of the species listed as having been found in March 1983 in 29 Alberta pet sales outlets are C.I.T.E.S. Appendix I species.

(2) Since October 29, 1981, all psittacines (except Budgerigars), if they are not in Appendix I, have been placed in Appendix II of C.I.T.E.S. (Hampshire's article did not indicate this, so all of the parrots from Blue-fronted Amazon on page 55 to Mealy Parakeet on page 57 should not have "C.I.T.E.S. Appendix II" added to their comments.

(3) All Iguanas (Iguana spp.) and all constrictors (Boidae spp.) are regulated by C.I.T.E.S. either through Appendix I or II. All primates are also covered by C.I.T.E.S. appendices.

(4) Neither Appendix II or III species need Canadian C.I.T.E.S. import permits, but they do need appropriate foreign export permits in addition to the health certificates/permits from the Health of Animals Branch, Canada Department of Agriculture, before entry to Canada is allowed.

(5) The Red-eared Finch (Zonaeginthus oculatus) listed by Hampshire is not included in any C.I.T.E.S. appendix.

This clarification alerts us to the fact that, while no species found by Hampshire was illegal under federal regulations, all of the 64 species of parrots were C.I.T.E.S. Appendix II specimens. Included in Appendix II are species which, although not necessarily now threatened with extinction, may become so unless trade in specimens of such species is subject to strict regulations in order to avoid utilization incompatible with their survival.

EGG SAC INCUBATION AND RELATED ACTIVITIES BY THE BLACK WIDOW SPIDER, LATRODECTUS HESPERUS CHAMBERLIN AND IVIE, IN ALBERTA, WITH NOTES ON OTHER SPECIES (ARACHNIDAE: ARANEIDA)

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Many lycosid spiders have been observed positioning and repositioning the egg sac while it is attached to the spinnerets so that the eggs inside can be warmed or incubated by the sun (Gertsch, 1949; Levi et al., 1968; personal observations). It is likely that pisaurids, which carry their egg sacs with their cheliceral fangs, may also do this before placing the egg sacs in silkin retreats among branches or leaves of low bushes, just before the spiderlings emerge. Little or no information is available, however, for other spider groups or species regarding this kind of activity.

Kaston (1970) made an excellent study on the comparative biology of the three recognized species of black widow spiders of the genus Latrodectus in North America. However, he made no mention of egg sac sunning or incubation activity, as all observations were made under laboratory conditions (Kaston, 1970). McCrone and Stone (1965) discussed habits and life history of Florida widow spiders, but did not mention egg sac incubation. Our observations have been that in laboratory conditions, or in a situation such as being under a house, the egg sacs are rarely, if at all, moved from the time they were made. Thorp and Wilson (1945) mentions, "... we have noted the tedious process by which the spider manipulates it [the egg sac] back into a position of her own choosing", but they did not discuss how the female black widow spider did the egg sac manipulation. They did note, however, the purpose for relocating the egg sac - to place it near a rock that had been heated during the day and which was still warm late in the evening. This was the only reference we could find that even mentioned relocating egg sacs for incubation purposes in non-lycosid spiders.

The purpose of this article is to discuss observations made on egg sac incubation activity by a black widow spider, L. hesperus Chamberlin and Ivie, and on similar behaviour or several other species of non-lycosid spiders.

During the summers of 1978 to 1980, we were in southeastern Alberta making motion picture films of the animals and plants in the shortgrass prairie. Among others, we were photographing black widow spiders, and had the opportunity to observe a number of females with their egg sacs and/or young, and in a few cases, courting males. [Male black widow spiders are not black as are the females. The males are variously coloured: carapace can be dark grey to black, sternum dark on the margins with light-coloured centre; legs can be annulated (dark and light bands); and the abdomen can have grey-green, tan and orange colours in distinct patterns. And, contrary to popular opinion, male black widow spiders are as poisonous as the females, but because they are so much smaller than the females, their bites are troublesome only when the bite where the skin is thin, areas such as around the lips, ears and the genitals.]

Black widow spiders are widespread and very common throughout most of the south-eastern parts of Alberta (approximately Empress northwest to Hanna and Drumheller, south to Lethbridge and Coutts). They are frequently found just within the entrance of abandoned ground squirrel and badger holes, but they can also be found in and around buildings. Their usual prey are the small flies and other insects that frequent burrows, and they are fully capable of ensnaring grasshoppers, crickets, moths, large beetles and reptiles (Kaston, 1970).

Sometime after mating (Kaston, 1970: 7 to 305 days), each female black widow spider will usually prepare from one to three large egg sacs (Kaston, 1970: reported 21 egg sacs from one female). Each egg sac may contain from 160 to 598 eggs (Kaston, 1970). The egg sacs are a light cream-tan coloured, about 10 to 14 mm in diameter, and have a crinkly, leathery texture. In Alberta, egg sacs of Latrodectus hesperus can be found from as early as 6 June to as late as 27 August.

When we first started photographing the black widows and egg sacs, we thought that the spiders were moving the egg sacs because of disturbance on our part. However, it soon became apparent that the egg sacs were being moved to more favourable sunlight and temperature conditions.

During the course of a day, the egg sacs might be relocated as often as once in 30 minutes, and over a vertical distance of 30 cm and a horizontal distance of 25 cm. The total accumulative distance that egg sacs might be moved during the course of one day could approach one metre, though most were moved about 60 cm. These may seem like incredible distances, but for each movement out of the hole in the morning, there was a return in the evening to the overnight resting site. And, if it rained during the day, the egg sacs could be moved in and out again, doubling the distance.

In the evening the egg sacs are relocated and attached next to the roof of the burrow, just out of reach of rain and dew. As the sun warms the air in the morning, the female black widow brings the egg sacs up from the overnight resting site to a spot where they can be warmed by the sun. The egg sacs are relocated often during the day to accommodate the changing sun and temperature conditions. At all times, the egg sacs were held in place in the spider's web by at least three or four strands of silk. The egg sacs were always moved as a group (attached to one another by short strands of silk).

The method for moving the egg sacs is about the same as black widow spiders use moving larger, captured prey (Gertsch, 1949). Assume, for example, the egg sacs are to be moved upward. The spider attaches several taut strands of silk to the up-facing side of the egg sacs and to the web. The restraining strands of silk on the opposite side are then cut with the spider's mouth parts. New taut strands of silk are again attached between the egg sacs and the web, and the restraining strands (which were the previous "pulling" strands) are again cut. By repeating this process many times, the egg sacs are laboriously moved by the spider to a location for incubating them.

Several species of spiders have been observed relocating egg sacs for incubating purposes. They are Niottiura bimaculata (L.) (= Theridion bimaculatum), Theridion sexpunctatum Emerton (both theridiids), and Dictyna borealis Pickard-Cambridge (a dictynid). Savory (1928) noted that N. bimaculata (in England) females carried their egg sacs clasped in their legs, but made no mention of the use of the spinnerets for carrying the egg sacs. Mackie (pers. comm., 1975) noted that the spinnerets were used in the British representatives of N. bimaculata. The females of N. bimaculata (in

Ottawa, Ontario) and Theridion sexpunctatum (at Wabamun Lake, Alberta) were not seen to have much web from which the egg sacs could have been suspended. It is possible that the spiderlings were nearly ready to emerge from the egg sacs, and that the females had vacated the nest site. These females carried their single, large egg sacs attached to the spinnerets in the same manner as lycosid spiders. Niottiura bimaculata females used the hind legs to support the egg sacs and abdomen, but T. sexpunctatum females did not. (Colour photographs were taken of both species of theridiids that show clearly the egg sacs being attached to the spinnerets.) To the best of our knowledge, this is the first published account of non-lycosid spiders actually using the spinnerets to carry egg sacs. Neilsen (1931) wrote that the females of N. bimaculata "...attaches it [the egg sac] to the spinnerets...", but did not indicate any activity of carring the egg sac about. Locket and Millidge (1953) indicated that females of N. bimaculata "... carries her cocoon under her body", but did not indicate how.

It is most likely that the ability to carry egg sacs attached to the spinnerets has evolved several times, and may be discovered in a number of other spider species. We stress that these two theridiid spiders carry the egg sacs attached to the spinnerets mainly when relocating the egg sacs, and not all the time as do the females of lycosid spiders.

At Lake Hazen, Ellesmere Island, NWT, females of Dictyna borealis were observed moving their egg sacs about one cm vertically within the nest/web site in Dryas integrifolia plants - up for incubation, down for inclement weather or nighttime. The egg sacs were grabbed by the spider's cheliceral fangs and literally dragged up or down through the webbing. At no time were the spinnerets or the hind legs used on the egg sacs directly. D. borealis is strictly a high arctic spider (Leech, 1966), but the egg sac moving activity can be observed in other members of the genus Dictyna, which is widespread in the northern hemisphere.

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WESTERN REGIONAL CONFERENCE, NORTH AMERICAN BLUEBIRD SOCIETY PORTLAND, OREGON, JUNE 18-20, 1983

by Don Stiles
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The North American Bluebird Society held its second Western Regional Conference at Lewis and Clark Community College in Portland, Oregon, June 18-20, 1983. The first day was devoted to presentation of papers, the following day field trips were offered, and on the last day a post-conference bus trip to Columbia Gorge was arranged. A banquet and evening program featured a talk by Dr. Lawrence Zeleny, founder of the North American Bluebird Society.

A number of points were made by various speakers, including:

- Western Bluebirds appear exclusively west of the Cascades, Mountain and Western may overlap between the Cascades and the Rockies.

- The original standard hole size for Bluebirds was 1-1/2". Lately, reports have come in from Washington, Montana, Idaho and southern Alberta that a larger hole of 1-9/16" and even 1-5/8" gave a dramatic increase in Mountain Bluebird nestings. Dr. Lawrence Zeleny, the speaker, cautioned that 1-5/8" was large enough for starlings, but conceded that there may be a slightly larger population of Mountain Bluebirds in the above-mentioned areas that need 1-9/16" holes.

- Tree Swallow/Violet-green Swallow competition: each species has a territory and two pairs of the same species will not nest close to one another, but will tolerate another species close by. Therefore, if a second house is placed nearby (two fence posts apart, or even back-to-back on the same telephone pole) the swallows will use that rather than take over a bluebird nest.

- It has been established the bluebird incubation period is 14 days, and the feeding period to fledging is 20 days.

- The best bluebird habitat is short grasses interspersed with trees. One speaker suggested Bluebunch Wheatgrass as a diagnostic species for finding bluebirds, and said they would not tolerate long grasses.

- Bluebird house plans were presented by several speakers, and most were made of 1" lumber, often cedar, rather than plywood.

- To reduce House Sparrow competition, experiments have been made using open-topped boxes with screens, with some success, although this arrangement is considered undesirable if a rainy spell occurs.

- One solution to the parasite problem is insecticides, although there may be some delayed mutegenic or carcinogenic effects. Some success in preventing blowfly parasitism has been reported by putting screening 1" from the bottom

of the box. The blowflies drop from the nesting material to the bottom of the box when not feeding and cannot climb back.

- Regarding competition with House Wrens, the only current solution is to move the boxes away from trees to more open situations.

- Mistletoe has proven to be a winter food of the bluebird.

Topics which did not deal with bluebirds included Mt. St. Helen's (the re-establishment of some plants and animals is occurring much more quickly than expected, and some hibernating animals which had not yet emerged before the May 25, 1980, explosion, were not affected seriously) and State fund-raising for wildlife (Oregon, for example, has in place a system whereby individuals can direct a portion of State Income Tax refunds to non-game wildlife. This generates funds for endangered species such as White Pelicans, Snowy Plovers, Spotted Owls and Peregrine Falcons, as well as snakes, turtles, seals and habitat reconstruction. In 10,000 nest boxes have been given to the public by the State.)

In addition to formal presentations, awards were given to several people who have participated in bluebird conservation and education, including one to Duncan Mackintosh of Lethbridge, who put on 15 bluebird shows last winter to various groups.

Three field trips were offered, including one to Anton Koch's bluebird and swallow farm, one to visit the Portland area bluebird trails, and one to Sauvie Island Wildlife Refuge on the Columbia River. Of special interest was the trip to Anton Koch's "bluebird and swallow farm". Koch, a semi-retired farmer, has a 250-acre fruit farm south of Portland. He has shown great ingenuity in building nest boxes including some which hang from wires like clothes from a clothes line, and boxes built especially for wintering bluebirds, complete with porch and an inside perch. Another of his inventions is an artificla mud-cement-vermiculite Cliff Swallow nest, of which he has 130. All the Cliff Swallows have to do is put a special entrance on the house to identify their own. With some 500 nest sites provided for Western Bluebirds, Tree, Violet-green and Cliff Swallows, there is no need to use insecticides on this fruit farm!

I found the conference an enjoyable opportunity to learn what others are doing on bluebird trails, to renew acquantenances with those who were at the Brandon Conference two years ago, and to have a short holiday in a different part of the continent.

OVERHEARD. . .

"That extinction is a natural phenomenon is sometimes advanced as an excuse for not trying to rescue endangered species. This is, of course, nonsensical, because although natural extinction is very gradual, occurring over many millennia, today there is considerable additional extinction caused by human interference, so that extinction has become an unnatural phenomenon."

Submitted by Murray A. Tozer, from the paper "Threatened and Endangered Species" by S. Dillon Ripley and Thomas E. Lovejoy

RECIPIENT OF THE 8TH LORAN L. GOULDEN MEMORIAL AWARD: MARTIN K. McNICHOLL - EDITOR/WRITER EXTRAORDINAIRE

by D.V. (Chip) Weseloh
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The Loran L. Goulden Memorial Award is presented annually by the Edmonton Natural History Club, in recognition of outstanding contributions to the study of natural history in Alberta. The award is in memory of former Edmontonian, Loran L. Goulden, a young, enthusiastic amateur naturalist turned professional who was killed in a plane crash in 1974 while working in British Columbia. Since its inception, the Award has been given to Dick Dekker, Prof. Ray Salt, Dr. Charlie Bird, Robert Lister, Joy Finlay, Dr. John Powell and Dr. Lois Fenna. The 1983 award was presented to Dr. Martin K. McNicholl at the January, 1983, meeting of the Edmonton Natural History Club. Martin was nominated for his field investigations and writings on the natural history of Alberta, his organizational work with several natural history clubs in Alberta, and his editorship of the Alberta Naturalist and its various Special Publications.

As with most of the past recipients of the Award, the name of this year's winner is a household word in most Alberta naturalist circles - and, indeed, in this case, most naturalist circles from Winnipeg to Edmonton/Calgary. Martin's biography appeared in a recent AN (AN Special Issue No. 1: 103-105, 1981) but a few highlights are presented here.

Martin Keli McNicholl, of Canadian and Icelandic descent, was born in Winnipeg in 1946. He remained there through university and enjoyed frequent family outings to seasonal homes at Lake Winnipeg and Ingolf, Ontario. His interest in birdwatching and natural history began before he entered kindergarten and was promoted during his childhood by his aunt, Gertrude McNicholl, and a second cousin, Mrs. Grace Keith.

While at the University of Manitoba, Martin completed his Master's degree on Forster's Terns at Delta Marsh and worked with such well-known naturalists/biologists as Al Hochbaum, Bob Nero, Roger Evans and others. In 1971, Martin moved to Edmonton and the University of Alberta to do a Ph.D. on Blue Grouse. For the next four years he spent summers on Vancouver Island and the rest of the year in Alberta. Since shortly after completing his Ph.D. field work, Martin has worked as a biological consultant for Peregrine Research and Documentation (Edmonton), the Lombard North Group Limited (Calgary), Beak Consultants Limited (Calgary), and done considerable work as a freelance writer, editor, educator and biologists in Alberta, British Columbia and Ontario. He is currently living in Toronto and working on Herring Gulls for the Canadian Wildlife Service, Ontario Region.

While professional biology is Martin's main livelihood, natural history and club organizations have always been his forte and first love. Martin is one of those few people (in general, but perhaps more widespread among biologists) who seem to be doing for a living pretty much what they do for a hobby!

Martin first became associated with natural history clubs in an executive capacity when he served with the Natural History Society of Manitoba from 1965 to 1970.

Martin on a relaxing birdwalk, Garden Island, Kingston, Ontario, 1983.

Since that time he has held executive positions with the Manitoba and Edmonton chapters of the National and Provincial Parks Association of Canada, the Edmonton Natural History Club, the Edmonton Bird Club, the Federation of Alberta Naturalists, Saskatchewan Natural History Society, and the Canadian Nature Federation.

In addition to his work as a professional biologist and a hardworking supporter of natural history clubs, Martin is a writer and editor of boundless energy! He has contributed in the neighbourhood of 160 articles, notes and book reviews to various natural history newsletters/bulletins and scientific journals. Besides his own writing, Martin has an uncanny knack of keeping track of what everybody else writes. I visited his apartment in Toronto recently and found dozens of well-organized file card boxes listing who has published what where. He uses these to good advantage and has produced bibliographies of both Manitoba and Alberta ornithology. Needless to say, bibliographies have a way of getting out of date, and Martin is now thinking of updating them!

In addition to these many accomplishments, Martin has served as editor of both Manitoba and Alberta provincial natural history publications. In Alberta, there have been five editors of the Alberta Naturalist over the last ten years, but only two different individuals have been involved. Martin served as editor in 1976/1977 and again during 1979/1981. (It seems Martin and Ginny change off whenever one of them is tired of it!!)

As a full listing of Martin's publications would carry into the next issue of the AN, I have produced below instead a Selected Bibliography of his work, dealing primarily with Alberta material.

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DOWNY WOODPECKER VS. YELLOW-BELLIED SAPSUCKER

by Jim Lange
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On May 17, 1983, while walking through a small patch of aspen, I noticed a female Downy Woodpecker flying erratically around a dead aspen poplar tree and making much noise. As there was a Hairy Woodpecker nest nearby the noise alerted me to the possibility that the Downy might also have a nest in the area. Upon closer examination a small hole was found about 10' up in the poplar. The cause of the disturbance was a male Yellow-bellied Sapsucker feeding on the same tree.

The female Downy was noisily dive-bombing the sapsucker, and several times she struck the sapsucker hard enough that he lost his balance, although he continued to feed. The closer he got to the hole, the more intense the barrage became. At one point he even stuck his head in the hole, while the female Downy maintained a constant attack. After about 20 minutes, the male Downy Woodpecker arrived and, making a highspeed pass, he hit the sapsucker, knocking him from the tree momentarily.

Adding to the pandemonium, another male sapsucker arrived at the tree, upon which the first male sapsucker drove the late-comer away, and then returned to the poplar. The two Downy Woodpeckers continued their attack on the male sapsucker, and after about ten minutes, the sapsucker was driven off. The male Downy Woodpecker pursued the fleeing sapsucker a short distance before returning to the poplar. The female worked her way up the tree and disappeared into the hole.

After the commotion subsided, a careful search revealed that the tree had been used in the past as a nest tree for sapsuckers, with at least three old nest holes visible.

FISH-WATCHING?

by Liz Stinson
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I suspect everyone reading this knows precisely what is meant by the term "bird-watching". This activity is widely recognized as a legitimate recreational interest and is strongly encouraged as a much more acceptable alternative to the earlier custom of "appreciating" birds with the help of a shotgun. Yet, if I were to suggest that "fish-watching" is also a legitimate pastime I might be met with a few smiles (at least!). However, the overwhelming response to a trip to the Adams River in British Columbia last fall (sponsored by the John Janzen Nature Centre) indicates the potential interest in this activity. I'm sure those who were on that trip or anyone who has had the chance to observe spawning runs of salmonids will agree that fish-watching has a certain excitement about it.

Alberta fish-watchers needn't travel to B.C. to observe spawning activities (although those of the Pacific salmon species are best-known and can be spectacular). Our own trouts and chars and suckers congregate in streams on an annual basis. If such spawning areas are shallow then the fishes can be easily watched from a streambank or bridge. I suggest checking with your local fishing enthusiasts, equipment suppliers, or Fish & Game clubs for specific sites in your area.

Catch-and-release fishing is another way of fish-watching and it gives the fisherman and those with him the chance to appreciate the variety of colour patterns exhibited by different species. Though a certain amount of stress is imposed on the animal being sought, this can be minimized by not letting the fish "fight" for a long period of time before landing it, by using barbless hooks, and by taking care to ensure that the fish is in relatively good shape before releasing it. It is a skill that, like any other, requires practice. No doubt some fish will die in the process (but these needn't be wasted). However, if the alternative is the almost automatic death of the animal, surely this attempt is an improvement.

The F.A.N. directors recently had their fish-consciousness raised. The AN will include more articles in the future on this group of vertebrates, particularly those whose habits make them easy candidiates for fish-watchers' "life lists".

NATURALISTS' BOOKSHELF

A FIELD GUIDE TO WESTERN BIRDS' NESTS IN THE UNITED STATES WEST OF THE MISSISSIPPI RIVER

by Hal H. Harrison. 1979. Houghton Mifflin Co., Boston. xxx + 279 pp. $11.95, US.

At the turn of the century, Oology, the study of eggs, and Nidiology, the study of nests, were thriving branches of Ornithology, with at least three major journals devoted to them. One evolved into the Wilson Bulletin, but the other two disappeared into oblivion as egg-collecting lost favour and eventually legality. Little attention was then paid to eggs or nests except as components of general natural history studies. In recent years, eggs and nests have received increasing attention, partly as a result of interest in chemical contamination of eggs. With this renewed interest and the proliferation of field guides in recent years, a field guide to bird eggs and nests seemed inevitable. Ironically, two publishers undertook this task in North America at about the same time, and both with authors named Harrison!

This guide is a companion to Hal Harrison's earlier guide (1975) in the same series to eastern bird nests. Thus, like Peterson's bird guides, one needs two books for complete coverage of nests and eggs in southern Canada. Unlike Peterson's guides, the dividing line between Harrison's guides is the Mississippi River, so the western guide covers a much broader area and many more species than the eastern. Although the western guide should contain most species that are ever likely to nest in Alberta, Harrison's two guides combined cover only the contiguous 48 states, not the entire continent. Thus, several species nesting in northern Canada and Alaska are not covered by either guide. For this reason, readers who travel widely during the breeding season would be better served by selecting Colin Harrison's guide, which covers all of North America north of Mexico in one book (published by Collins, London 1978), and has the added bonus of including nestlings. Hal Harrison's guides, on the other hand, do have the advantage of greater familiarity by the author with many of the species covered.

This guide consists of an Editor's note by Roger Tory Peterson, followed by the author's preface and a section called "about the book" in which general comments are made. Both Peterson and Harrison caution the reader about the danger of prolonged or frequent visits to nests and emphasize the importance of giving priority to the birds' welfare. The bulk of the book is, of course, individual accounts of each species - 520 in all. Most species accounts consist of about 1/2-page of text, but a few are merely brief notes mentioning a few nestings in the region covered by the book. A series of 31 colour plates, with 8 photographs per plate, grace the centre of the book, and many black-and-white photos are scattered throughout the text. A brief glossary of terms and a species index conclude the book.

A guide to nests and eggs should serve three functions: (1) help identify nests and/or eggs found where no birds are present; (2) inform an observer attempting to find a nest of a particular species as to what to look for; and (3) as a reference source.

As a guide to identifying mystery nests, this book will prove useful primarily to observers who already have a fair knowledge of types of nests built by local bird

species. The species are considered in taxonomic sequence, and comparisons are often among nests/eggs of related species only. For example, grebe nests are compared with other grebe nests, not with floating nests in general. Yet, I found Pied-billed Grebe nests to more closely resemble nests of American Bitterns than those of Western Grebes (except in size). And how is one to zero in on all those tidy little nests one finds in willows after the leaves fall with only a vague notion that it was probably built by some passerine? There are exceptions: the Black Rail's nest is compared with that of a meadowlark, and the Purple Finche's both with those of such closely-related species as Cassin's and House Finches, and with the unrelated Western Tanager's nest. On the whole, however, one must read through much of the book to track down mystery nests.

As an aid to finding the nest of a particular species and as a basic reference source to nests/eggs of species in Alberta and other parts of western North America, the book is excellent. For each species, Harrison outlines breeding range within the area covered by the book (thus missing Alberta), habitat, nest, eggs and miscellaneous notes. These accounts have been researched thoroughly, and most appear to be virtually complete, although there are a few lapses. For example, we are not told that Double-crested Cormorants often nest among White Pelicans on the prairies, nor that they nest on cliffs along coasts. We are told that Forster's and Common Tern eggs are indistinguishable, but not warned that Common Terns occasionally nest on floating mats of vegetation or on muskrat houses, sites more typical of Forster's. On the other hand, the author has included many unusual cases, often from his own experience, such as the Lark Sparrow nest he found 25 feet above ground instead of its usual ground site. Information often includes behaviour related to nesting, such as mating system and manner of a flushed bird in returning to its nest. Egg sizes are given for all three races of the Yellow-bellied Sapsucker recognized at the time the book was published, information that proved fortunate in light of the recent recognition of the Red-breasted as a separate species, and will prove even more fortunate if the third race is eventually recognized as a further distinct, Red-naped, as advocated by some authors.

In conclusion, as a guide to identifying nests and eggs, this book could be greatly improved. As a source of information on the species covered, either in the field or for reference, it can be recommended highly.

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ONTARIO BIRDS: JOURNAL OF THE ONTARIO FIELD ORNITHOLOGISTS

Editors: Chip and Linda Weseloh. Vol. 1 No. 1, 40 pp. Membership, $10/yr., includes newsletter and OB. Ontario Field Ornithologists, Box 1204, Station B, Burlington, Ont. L7P 3S9.

The Ontario Field Ornithologists was formed in 1982. The first issue of their publication, Ontario Birds, represents an impressive debut. Volume 1 Number 1 features the following articles: "Ontario Bird Records Committee Report for 1982"; "A Record of the Yellow-throated Warbler from Moosonee"; "Field Identification of Shrikes"; "A Birding Site Guide to Thickson's Woods, Whitby"; "A Bibliography of Ornithology for Oxford County, Ontario"; and "Probably Nest Construction by Great Horned Owls". In addition to featured articles are five notes, one book review and OFO announcements.

The quality of Ontario Birds is commendable. Professional graphics, layout and

artwork compliment the high-caliber articles. Considering the relative youth of the Ontario Field Ornithologists, Ontario Birds must be soundly applauded, and I suspect it will soon become, in stature, the eastern birders' equivalent of Blue Jay.

- Virginia Young

JUST BATS

by M. Brock Fenton. 1983. University of Toronto Press, Toronto. 165 pp. $25.00 cloth, $9.95 paper.

M. Brock Fenton is a professor of biology at Carleton University, Ottawa, and a research associate at the Royal Ontario Museum, Toronto. He has studied bats for many years having completed both his Masters and Doctoral projects on some aspect of bat biology. He has also supervised many graduate students in their studies of bat biology. His own area of research has taken him to many areas of the world. He has published papers on bat ecology, behaviour and echolocation. As well, he is frequently asked to speak to audiences of lay people. He is, if not the most active, one of the most enthusiastic supporters of bats in Canada and is well-qualified to write a book on "just bats".

Just Bats if a comprehensive essay on bats for the lay person. It has 17 chapters that cover most topics of bat biology. Some of the subjects covered are: flight, echolocation, seeing, smelling, diet, migration, public health and conservation. Also included are excellent black-and-white photographs, an appendix of common and scientific names, a selected bibliography that includes books for children and some on methods for studying bats. If a criticism can be directed at this book, it would have to do with the uneven treatment of the various subjects. Some topics get a great deal of attention, others less so. If, however, all subjects were treated equally, the book would have been too long or else too superficial. As it is I feel the topics covered tend to whet the appetite so a reader can pursue the subject further if they so desire.

In the Introduction, Dr. Fenton states, "Bring up the subject [of bats] at almost any gathering and the reaction is generally the same - bats are dirty and dangerous, common carriers of rabies, ugly creatures that get tangled in your hair". I recently had an experience with a lay person that typifies this attitude. I was in a bank and was purchasing a money order for a subscription to a bat magazine. When I mentioned the name of the publication to the bank clerk, she questioned me as to why anyone would want to study, let alone handle, such ugly, creepy creatures. Unfortunately, people like this bank clerk will probably not purchase this book or even look at it in a library or bookstore but it is precisely for these people that Dr. Fenton has written his book.

To the questions of why study bats or of what value is bat study, Dr. Fenton points out that through this type of study a person can learn more about the world and "how animals interact with their surroundings and other animals, including man". By studying echolocation and the way bats assimilate the information in their brain, we may ultimately understand the way a human brain functions. Such is the goal of all research - to gain a better understanding of the biology of man.

Throughout the text of his book, Dr. Fenton uses common names for bats. This is a concession to those persons who may be frightened by the Latinized technical name. By including an appendix that lists both the scientific and common names of bats any

objections to the use of common names should be overcome.

Just Bats is not a scientific book, but like many scientific works it points out areas where information is lacking and where further research is needed. Dr. Fenton writes in an easy, readable style, but he has not sacrificed his scientific background or training by using layman's cliches. His facts are scientific, his style is popular. It is a rare blend. If anyone has attended a lecture or talk given by Dr. Fenton, they will know of the enthusiasm he engenders when he speaks on bats. This same enthusiasm comes through in this book.

For a person who is interested in natural history and wants to learn more about some of the world's most interesting creatures Just Bats is an excellent choice. The price of the paperback version is reasonable, the type is clear and easy to read, the photographs and illustrations are good, and the overall esthetics of the book are pleasing. It is a book for lay people, written by a professional scientist that is factual and informative. I highly recommend it.

- Hugh C. Smith, Curator of Mammalogy,
Provincial Museum of Alberta, Edmonton

OF MICE AND MOLECULES: TECHNOLOGY AND HUMAN SURVIVAL

by Eric Skjei and M. Donald Whorton. 1983. The Dial Press, New York. 347 pp. $24.95.

This book is about the effects on the environment and human health of the pollutants and practices resulting from modern technology. It is written for the layman and its declared aims are "to combine accuracy with readability" and to "encourage rather than dismay".

It is certainly readable and will be of use to those engaged in environmental education or wishing to educate themselves and serve as a good starting person or group working on the effects on human health of a particular pollutant.

The book's accuracy appears to be good and many studies both pro and con the substances discussed are cited. Obviously, however, unless one had the time and knowledge to assess the methods and conclusions of those studies, a definite opinion on scientific accuracy cannot be given.

I cannot say I felt encouraged by what I read. The authors' 'encouragement' appear to be based on "ample indications that the technical ingenuity needed to find solutions . . . is available". However, as they also states that "the obstacles. . . tend to be a matter of politics and economics" and cite case after case of escalating health problems caused by the refusal of industries and governments to act even when faced with strong evidence of toxic effects, I think the reader is more likely to become dismayed than encouraged.

M. Donald Whorton, M.D., M.Sc., is Associate Professor of Occupational Health at the University of California, and Eric Skjei, Ph.D., would appear, from the titles of other books he has written, to be a psychologist, although this is not stated. Their style is lucid and rational, avoiding sensationalism. In the first chapter they point out that, while the focus of this book is on environmental health issues in the U.S., the most fundamental principle of all environmental matters is interdependence -- both

between different parts of the ecosystem and between different parts of the world. They explain some of the scientific terms used in the book and how a bioassay is done. It seems to be from the latter that the title was taken, chosen, I think, more for its 'catchiness' rather than its relevance.

Chapter 2 is a short course on human physiology with a section on cancer (including treatment which seemed inappropriate in this context). The following chapters are on occupational health hazards, the air, the water, the food supply, hazardous wastes and radiation. My only argument with these chapters is the authors' apparent belief that government requirements "that manufacturers prove their (chemical) products safe" are realistic.

Each chapter is clearly divided under sub-headings with footnotes and source notes. The illustrations are rather poor and often seem pointless. The two appendices, "For More Information" and "Emergency Assistance" apply only to the U.S., although the addresses given in the former might be useful. There is a good index. I was irritated, however, that the book is so tightly bound it will not lie flat.

The Postscript looks to the future. The authors feel the main tasks of industrialized nations are "to escape from our dependence on fossil fuels" and to decide whether the use of nuclear power is worth its inherent risks. They do not mention the possibility of nuclear war. In underdeveloped countries they see the increased use of chemicals to feed and keep healthy burgeoning populations and increased industrialization without the ability to pay for pollution control technology as major problems. They conclude, as they started, by point out that "in the long run environmental health is a global issue".

Skjei and Whorton have made a sincere and commendable attempt to educate and alert the general public. But how do you persuade the 'man-in-the-street' to read such grim indictments of his imprudent use of technology and such sad evidence of "man's inhumanity to man"? Perhaps that is up to us.

- Dorothy Dickson

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LETTER TO THE EDITOR

R.R. 3, Ponoka, Alta. TOC 2HO

22 June 1983

Dear Editor:

This fall the Environmental Council of Alberta will be conducting hearings in various parts of the Province on the loss of our agricultural land. As the cultivated regions of Alberta also provide much of the habitat for many of our remaining native species and natural communities, the future of our agricultural land should be a subject of great concern to all naturalists.

Marginal areas within the agricultural zone support populations of native species which were once abundant throughout south central Alberta. Now that the agricultural land base is being seriously depleted by urban and industrial encroachment, the agricultural industry is developing and promoting more efficient farming practices aimed at utilizing marginal land such as the grassy edges of croplands, roadside ditches, hillsides, sloughs and marshes. This makes good sense economically as it will probably provide better returns to the farmer, but the environmental costs will be high.

Wildlife simply cannot exist in regions subjected to massive cultivation practices. Eliminating the natural barriers between fields such as stands of trees, hedges, ditches and sloughs, also eliminates the plants and animals dependent upon these areas because there is nowhere else left for them. Some farmers already cultivate right into the roadside ditches, and county councils are zealously pouring chemicals onto roadside vegetation in order to improve visibility for motorists to protect them from destroying themselves at rural intersections, as well as weed control. Powerlines and railroad rights of way also receive the same treatment, as does much of our agricultural land.

All these practices are ruining more and more habitat; they are robbing our wildlife of living space and poisoning our environment. Many of these unnecessary and harmful developments could be avoided with education and wise land management practices. A great amount of destruction occurs through ignorance.

There is an urgent need to preserve habitat in the settled regions of Alberta. This point should be emphasized at the upcoming ECA hearings. People who have experienced the frustrations of public hearings are justifiably cynical of future ECA Hearings, especially those who attended the Red Deer River Dam Hearings. At that time, the whole issue was the folly of industrializing one of the most fertile and productive river basins in the Province. The government didn't listen then, and it probably will not listen this time, but others may be more receptive.

The upcoming ECA Hearings present an opportunity for naturalists to point out the urgent need for preservation of existing habitat and the harmful effects of many common farming practices. Such briefs and presentations will receive media coverage which will influence some of the people who cause environmental damage through thoughtlessness and ignorance. The ECA Hearings always receive wide coverage on TV,

the radio and in newspapers. The naturalists' concerns will be publicized if the naturalists are concerned enough to attend and present their views.

Sincerely, Dorothy Broadbent

[Hearings will be held as follows: Calgary, Oct. 12-14; Lethbridge, Oct. 18; Brooks, Oct. 20; Hanna, Oct. 25; Medicine Hat, Oct. 27; Olds, Nov. 1; Camrose, Nov. 3; St. Paul, Nov. 7; Wainwright, Nov. 9; Evansburg, Nov. 15; Barrhead, Nov. 17; Peace River, Nov. 22; Grande Prairie, Nov. 24; Vegreville, Nov. 29; Red Deer, Dec. 1; Edmonton, Dec. 5-7. FAN will be presenting the following brief. - Editor]

MAINTAINING AND EXPANDING THE AGRICULTURAL LAND BASE IN ALBERTA: FAN BRIEF

Throughout the world, large areas of prime quality farmland are being taken out of agricultural use by being appropriated for other uses. In developed countries, at least 3000 km^2 of prime agricultural land are submerged every year under urban sprawl. In addition, close to one-third of the world's arable land will be destroyed in the next 20 years if current rates of land degration continue.

In Alberta, Class 1-3 land, which are arable and often called "prime" agricultural land, constitutes 17% of the Province. With the inclusion of marginal Class 4 land, the proportion of the Province that is suitable for agriculture increases to only 32%. Edmonton, Calgary and Lethbridge are built on Class 1 land; Red Deer and Medicine Hat are on Class 2 land. The land surrounding these major centres, as well as other Alberta communities, is being quickly gobbled up by non-agricultural uses as the Province's population and industries concentrate more and more near the large cities. Between 1977 and 1979, 28,245 hectares of land were annexed by cities, and an additional 31,890 hectares were taken out of agricultural production and subdivided into acreages and country estates. Although new farmland is being opened up all the time in Alberta, the hectarage is small and most of these lands are not of the same high quality as the lands currently in demand. The need to examine the use of agricultural land in Alberta at this time is without question, and the decision by the Environment Council of Alberta to hold these hearings is to be commended.

The Federation of Alberta Naturalists recognizes the importance of maximizing agricultural production on suitable arable land in the Province. However, we must demand a holistic approach to the management of these lands. That is, when discussing the management of resources, the total ecosystem must be considered. Any modification of the environment to satisfy human needs and improve the quality of human life must take into consideration the social, economic *and* ecological factors. The conservation ethic, "we have not inherited the land from our parents, we have borrowed it from our children", must play an important part in any discussion of future agricultural land development and agricultural practices in Alberta. While development aims to achieve human goals largely through use of the environment, conservation aims to achieve them by insuring that such use can continue. Development, agricultural and non-agricultural, and conservation are, in effect, natural partners for long-term benefit. Unless development is guided by sound ecological principles, much development will continue to have undesired effects, to provide reduced benefits, or even fail altogether.

Conservation and development must be integrated to insure that modification of the environment does, indeed, secure the survival and well-being of not only all Albertans, but of our natural heritage, the resource.

An estimated 25,000 plant species and more than a thousand vertebrate species and subspecies are threatened with extinction. These figures do not take into account the inevitable losses of small animal species, especially invertebrates. Indeed, estimates which do attempt to take these into account suggest that from half a million to a million species will have been made extinct by the end of the century. If these species are allowed to disappear, the loss to humanity could be irreparable. The major contributing factor to species extinction is habitat loss.

Few people would argue with the premise that wildlife and natural habitat is a desirable and necessary part of our environment. The obvious values of wildlife - aesthetic, for use as food, to provide income, as a source for recreation and tourism - are generally accepted. However, another important aspect of conserving native flora and fauna for future generations is that of preserving the diversity of the gene pool found in our biosphere. The genetic material contained in the domesticated varieties of livestock, crop plants, trees, aquatic mammals and micro-organisms - as well as their wild relatives - is essential for the breeding programs in which continued improvements in yields, nutritional qualities, flavour, durability, pest and disease resistance, responsiveness to different soils and climates, and other qualities are achieved. These qualities are rarely, if ever, permanent. For example, the average lifetime of wheat and other cereal varieties found in North America and Europe has been estimated to be 5 to 15 years. This is because diseases and pests evolve new strains and overcome resistance, climates alter, soils vary, and consumer demands change. Farmers and other crop producers, therefore, cannot do without the reservoir of still-evolving possibilities available in the range of varieties of crops, domesticated animals and their wild relatives. Unfortunately, while the genetic base of the world's crops and other living resources is narrowing rapidly, the means by which this dangerous situation could be corrected, namely the diversity of crop varieties and their wild relatives, are being destroyed. The continued existence of wild and primitive varieties of the world's crop plants and animals is humanity's chief insurance against their destruction by the equivalents for those crops of chestnut blight or Dutch elm disease.

Aside from the obvious importance of maintaining gene stock for agricultural animals and crop plants, wild flora and fauna is also valuable to medicine. Although only a minute proportion of the world's plants and animals have been investigated for their value as medicines and other pharmaceutical products. According to one analysis, more than 40% of the prescriptions each year in the United States contain a drug of natural origin, either as the sole active ingredient or as one of the main ones.

It is also necessary to ensure that the loss of species does not impair the effective functioning of ecological processes. It is unlikely that the particular community of plants, animals and microorganisms that make up the ecosystems associated with so many essential processes - particularly pollination and naturally-occurring pest control - can readily be substituted by other communities. The genetic composition of such ecosystems may be crucial for their performance.

It may be asked at this point, "What does all of this have to do with Alberta farmland?" There are several species of plants, birds, mammals, reptiles and other living resources whose existence in the Province are known to be either threatened

or could be threatened if current practices of land use, including that use which so radically modifies the environment, farming, are not altered. (See Appendix I)

Farming practices necessarily impose stresses on native flora and fauna. The most obvious impact on wildlife is the destruction of habitat. Few species can exist in the monoculture fields of wheat, oats or barley, and forage cropping places other stresses on wildlife. A major environmental impact is the clearing of huge tracts of land of vegetation for the major part of each year due to intensive tillage and, in many cases, continuous overgrazing. Faunal communities are tremendously impacted by this habitat destruction, permanently, annually and seasonally. Community imbalance and structural shifts occur from the microbial level to the higher vertebrates. Fragile populations are eradicated, resiliant types survive at lower populations, and often less-desirable species flourish. These effects have been illustrated by W.F. Cown (1982, Modern Prairie Agriculture: Success with Conservation. In Agriculture and the Environment Symposium Proceedings, Can. Soc. of Environmental Biologists, March 6, 1982, Red Deer, Alberta) using waterfowl as an example, as follows:

> *"The agricultural region of the Prairie Provinces produces about one-half of North America's ducks. Paired breeders distribute over the marshlands in early spring in numbers dependent upon wetland availability. Early nesters like mallard and pintail have only dead vegetation from the previous year available as nesting habitat. This is in small strips and patches of native cover or broad expanses of grain and hay stubble. One-quarter to one-half of upland duck nests are set in farm fields. This is a trap. Nests in cropland stubble are usually destroyed by tillage in May and those in summerfallow stubble, in June. Those in tame hay are lost to mowing after mid-June. The majority of nests that survive mowing, as well as some incubating hens, are picked off by predators. Average nest success rates in these croplands is about 5% (Higgins, 1974). Because of extensive tillage and overgrazing, nests become concentrated in narrow bands of cover around marshes, in tree bluffs, and roadsides. These are too susceptible to predators. Nest success rates in native cover attained 80% in the 1930's, but have recently dropped to below 50%, and often only 10-20%. As the season progresses, new green growth provides improved cover for late nesting species and re-nesters in edge vegetation and the few pastures that are not heavily grazed. Broods from late nests generally are smaller and have less chance to survive because of decreased availability of water later in the season. This is especially significant during drought. Reduced duck production is the result, mainly due to agricultural activities. Similar stories can be told for many species of ground-nesting birds, small mammals, predators, deer, fish and invertebrates."*

It is the responsibility of Albertans to insure that we act as wise stewards of our resources. We, the Federation of Alberta Naturalists, are sure that by working together, not only can Alberta continue to be a major producer of food, but we can also retain the natural heritage this Province is rightly famous for throughout the world.

RECOMMENDATIONS

1. A major percentage of undeveloped land remaining in Alberta which could be brought into agricultural production consists of marginal land. These poorer

lands are most suitable for forage crops, grazing, and other farming activities related to the production of beef cattle and dairy products. At this time, the market for dairy products is being met by existing operations. A market for beef exists, but prices are so poor that farmers are forced to increase herd size and utilize more marginal land. Because of these economic considerations and the fact that marginal lands are important producers of wildlife, landowners should be discouraged from opening up marginal land for agricultural development. Accordingly, the Range Improvement Program grants should be discontinued.

2. In the County of Lacombe, with the assistance of government grants, last winter brushing was carried out along many undeveloped road allowances. Most of this clearing was unnecessary. Undoubtedly, the same thing occurred in other Counties. Much valuable native wildlife habitat was destroyed. In addition, windbreaks were removed and the possibility of serious future wind erosion has developed. Such clearing should not be encouraged. It should be carried out only in cases where the benefits are clear, and only after examination by and discussion with competent ecologists or wildlife biologists.

3. Ways of financially encouraging landowners to preserve wildlife habitat must continue to be explored. The Fish & Wildlife Division has developed a series of maps indicating "referral areas", areas which are especially important with respect to wildlife. The Red Deer County incentive program should be expanded to include all landowners whose land falls into these "referral areas". In addition, major projects in these areas, such as clearing or draining sloughs, should be subject to advice and supervision by Fish & Wildlife biologists or other government ecologists. As in the United States, government grants should be made available to those farmers who retain land in its native state.

4. A strong stand should be taken against annexation of land for "urban sprawl". Further growth of Alberta's major centres could be curbed somewhat by offering tangible encouragement to the business community to establish light industry in smaller centres which are built on marginal farm land.

5. Flooding of extensive areas of bottomland, riverine communities and pasture-land by the construction of large dams should be discouraged. Our best native habitat occurs in such areas. In addition, watershed transfer schemes aimed at increasing irrigation capacity in southern Alberta, currently under consideration, must be subjected not only to extensive environmental impact studies, but also go through the public hearing process before finalization.

6. Within each Wildlife Management Unit, waterbodies should be surveyed and prime habitat sloughs identified. These sloughs should not be drained.

7. Fertilizers, pesticides and herbicides are a major source of pollution in North America. In Alberta, there is evidence that the intensive and systematic use of these chemical compounds could present a threat of serious long-term consequences. One application of chemicals, spraying of noxious weeds, is of particular concern. Roadsides represent an important habitat, and, especially where extensive monoculture agriculture is practiced, can comprise a major portion of available wildlife habitat. The chemicals which are used, as well as the methods of application, must be reviewed with respect to their effects of wildlife and habitat. Accidental avicide has been reported in

pheasants and other game birds as well as nesting songbirds. The effects of roadside spraying on wildlife and the environment should be intensively studied. In addition, Fish & Wildlife biologists should review available literature on the effects of pesticides and other chemicals associated with agriculture on wildlife and the environment. If further studies are indicated, these should be undertaken, and if negative impacts can be minimized by changing either the chemicals used or the methods of application, these changes should be implemented in county roadside spraying programs.

8. Unimproved lands should be included in Grain Quotas as an incentive to preserve wildlife habitat.

9. Less environmentally-disturbing agricultural practices, such as Zero Tillage, should be researched further for practicality in the various regions of the Province, and actively promoted where feasible.

10. Little, if any, conservation-oriented teaching now occurs in the Province. All public and separate school, university, college and agricultural college students should receive basic education about agriculture and land management, and that education should include a strong background in ecological principles and conservation of wildlife and wildlife habitat.

11. Alberta farmers should be made aware of all aspects of regulations regarding wildlife and the environment. Too often, farmers, intentionally and unintentionally, destroy wildlife or wildlife habitat or foul the environment, legally and illegally, simply through lack of information.

12. The Bear Damage, Livestock Disaster Predator Indemnity and Wildlife Damage Fund for Crops compensation programs should be continued. The Livestock Damage Fund for crops, which currently pays 75% of market value of losses, and the Livestock Disaster Predator Indemnity Program, which pays 80% of market value, should increase payments to full value of losses, 100%.

[Note: Literature citations and the Appendix have been omitted here.]

FAN NEWS

FAN MEETING FIELD TRIP TO WAGNER NATURAL AREA AND CLIFFORD E LEE SANCTUARY, MAY 22, 1983

Despite a negative forecast, the weather on the May long week-end turned out to be perfect for field-tripping. Sunday, the day of the Wagner/Clifford E. Lee trip, gave us lots of sun with enough wind to keep most of the mosquitoes under control. Forty people gathered at the Provincial Museum, parcelled themselves into cars, and descended on an unsuspecting Wagner Natural Area and Alice Hendry by 10:00. The sensitivity of this peatland area was recognized as we divided into two smaller parties led by Alice and Terry Thormin.

The marl ponds and spring fen habitat unique to Wagner attracted the greatest interest as we looked for the earliest spring wildflowers. Bog violet, coltsfoot,

dwarf raspberry and shooting stars were found in open areas. The kidney-leafed violet was confined to shadier sections of the wooded areas. Mallards, Green-winged and Blue-winged teal, a Solitary Sandpiper, Red-tailed Hawks, Ruby-crowned Kinglets, Lincoln's and Savannah Sparrows were added to bird lists. Alice and Terry were able to bring the participants up to date on the efforts and plans of the Wagner Natural Area Society on behalf of this half-section of land. Also, the relating of the history of the area helped us appreciate how the property had come to the attention of local naturalists.

After a lunch stop in one of the open fields at Wagner, the car convoy travelled south on the Devon Road (Highway 60) to the Clifford E. Lee Sanctuary. Our leader was Mary Reine who has been involved in the development of the Sanctuary since its inception. Our visit here highlighted differences between a protected area in its infancy (the Wagner Natural Area Society is five months old) and one in which several years' work could be seen.

Of course, other differences were immediately obvious. The Clifford E. Lee Sanctuary protects a true marsh as well as upland areas. Everyone enjoyed the access to the marsh afforded by two kilometres of boardwalk. Red-winged and Yellow-headed Blackbirds were everywhere in the cattails that bordered the marsh. Out on open water, Ruddy Ducks, Redheads, Canvasbacks, Ring-necked Ducks and the occasional Bufflehead could be seen. A Marsh Wren made itself audibly evident but was not seen by any but the most patient observers (the writer was not in that category). For the wildflower watchers, starflowered Solomon's-seal, early blue violet and a wild pea offered photographic opportunities. As on our visit to Wagner, hearing the story of the development of the Sanctuary (successes and problems) from one who had a long-standing personal commitment to the area enriched the short time we spent there.

Thanks to Alice Hendry, Marg Reine and Terry Thormin for their leadership of the groups from those who were lucky enough to be there and from F.A.N.

- Liz Stinson

FAN PUBLISHES TEACHER'S HANDBOOK

The Federation of Alberta Naturalists has published a handbook, "Fall Out! . . Activities for the Outdoor Classroom", prepared by Liz Stinson. 1200 copies of the booklet have been distributed to Alberta Public School elementary teachers. The 20-odd page booklet marks FAN's third venture into special publications.

CLUB NEWS

BUFFALO LAKE NATURALISTS

The annual "Hamburger Cook-out" at Krugers was a resounding success, with a turn-out of 53 people. Field hikes turned up Lady's Slippers, Elephant's head, nesting avocets and bluebirds.

The Labour Day week-end will feature the annual Red Deer River Canoe Voyage. A trip to Drumheller is planned for September 18, and the first regular fall meeting, September 15, is "Bring A Friend Night".

CALGARY FIELD NATURALISTS' SOCIETY

Our year finished with the AGM in June and a most interesting talk on the role of fungi in the life of a tree by Bob Danielson.

Jim Posey was re-elected President and we are pleased to welcome five new Board members, including Sally Close as our new representative to FAN. Our thanks to outgoing Board members Steve Hannington, Tim Myres, Ted Koziel and Dorothy Dickson and to those stalwarts who have agreed to serve another term. Meetings will resume on September 21.

- Dorothy Dickson

EDMONTON NATURAL HISTORY CLUB

The summer field trip program included trips to Beaverhill Lake (naturally!), the Pembina and Athabasca Rivers near Freedom, and camping trips to Sir Winston Churchill Park near Lac la Biche and to the Cardinal River Divide south of Hinton.

RED DEER RIVER NATURALISTS

As usual, the Red Deer River Naturalists hold the record for the busiest field trip season of any club. Areas visited include Blackfalds Lake, Gaetz Lakes, Collett Reserve near Morningside, Rimbey area, Ellis Bird Farm, Blindman Valley and Blindman River, Waskasoo Park, Dry Island Buffalo Jump Park, Hazlett's Lake, Fleming's Slough, Watchman Lake, and Medicine Lake. RDRN joined with the Waskasoo Camera Club for a trip to Rumsey. A canoe trip on the Battle River and 3 camping trips, one to Sunset Pass, another to Ram Mountain/Gap Lake, and a third to the Kootenay Plains, rounded off their busy schedule.

NOTES AND NEWS

BOW CORRIDOR BLUEBIRD TRAIL

In April, 1981, Nancy and Norm Murray and Evlyn Annand put 39 boxes up along the north side of the TransCanada Highway east of Canmore. In 1982, three pairs of Mountain Bluebirds built nests and laid 17 eggs. Two nests were successful and fledged 11 young bluebirds. There were also 5 Tree Swallow nests containing 23 eggs. Fourteen young fledge from 3 of these nests. A pair of Mountain Chickadees occupied one other nest and raised 6 "very cute" babies (to quote Nancy). Finally, one pair of House Sparrows unsuccessfully tried to nest in a box. Happily, no boxes were vandalized. - Geoff Holroyd, from the Bow Valley Naturalists Newsletter.

LORAN L. GOULDEN MEMORIAL AWARD NOMINATIONS

Nominations for the Loran L. Goulden Memorial Award for outstanding contributions to natural history in Alberta are sought at all times, but to be considered for the 9th Annual Award, should reach the Chairman of the selection committee by 1 December 1983. The 9th Award will be presented at the annual General Meeting of the Edmonton Natural History Club in January, 1984. Nominations may be for contributions in any field of natural history within the Province of Alberta. All previous nominations of persons who have not yet received the award will be considered, but

nominators of such persons are encouraged to update these nominations. Previous Awardees have been: Dick Dekker, W. Ray Salt, Charles E. Bird, Robert Lister, Joy Finlay, John M. Powell, Lois Fenna and Martin McNicholl. Nominations should be sent in writing to the Chairman or given to another member of the committee (Margot White, Edmonton; Dorothy Broadbent, Red Deer, Gwen McCauley, Ottawa). John M. Powell, Chairman, Loran L. Goulden Memorial Award Selection Committee, 5828-143 St., Edmonton, Alberta T6H 4E8 (435-7006).

CNF ART COMPETITION ANNOUNCED

This fall, the Canadian Nature Federation and the National Museum of Natural Sciences will be holding a competition for the biennial nature art exhibit. While the competition will remain open to all artists, the entry and jurying procedure will be changed, in that artists are asked to send a preliminary entry consisting of good quality photographs of the pieces they hope to submit. Following judging of these photographs, a short list of artists will be invited to submit their originals. When these are received, a final selection of 35-40 works will be selected for the national travelling exhibition. For further details, write to CNF, 75 Albert St., Suite 203, Ottawa, Ont. K1P 6G1.

NEW BIRD QUARTERLY JOURNAL

This fall a bird quarterly, called Wings, will commence publication. It will be an informational journal aimed at the person who knows identification and other basics but who would like to learn more about what is going on in ornithology. There will be no original papers in it, except for short behavioural notes. Rather, it will cover recently-published research as well as other ornithological information, all presented in "plain language". Wings will try to provide a bridge between amateurs and professionals, not only bringing information to amaterus but encouraging and facilitating amateur participation in ornithology. For further information contact the publisher, Helen A. Lapham, Box 226, Lansing, NY 14882. [I hope to feature a review of this new publication in a future "Naturalists' Bookshelf" - Ed.]

AUTO EMISSIONS CONSULTATIONS BEGIN

The Environmental Protection Service has stated their intent to revise the current motor vehicle emission standards for carbon monoxide (CO), nitrogen oxide (NO_x) and hydrocarbons (HC) by reducing the allowable emissions for each, starting in 1986. Nitrogen oxides are implicated in acid rain, CO is a threat to human health, and HCs are precursors of oxidants. Canada's standards currently allow for more emissions of these noxious substances than the U.S. government.

PUKASKWA NATIONAL PARK OPENED

Pukaskwa National Park, a new national park on the north shore of Lake Superior, has officially opened. Set in the rocky Canadian Shield between Sault Ste. Marie and Thunder Bay, Pukaskwa is the largest national park in Ontario. Its most impressive natural feature is the Lake Superior coastline. Massive exposed headlands protect quiet bays filled with small islands, shoals and countless sand and boulder beaches. The entrance to the park is a 15-minute drive from the Trans-Canada Highway, midway between Sault Ste. Marie and Thunder Bay. (Environ. Update 4(2), July 1983).

CANADIAN BANDING IN 1980

The Canadian Wildlife Service recently issued its annual summary of banding in Canada during 1980, as compiled by C. Hyslop and A.M. Demers (Can. Wildl. Serv. Progress Notes No. 135, 1983). Fifteen master permit banders worked in Alberta during that year, constituting 12% of the Canadian total, and banded 8 game and 96 non-game species. Highest totals banded in Alberta of non-game species were 1856 Double-crested Cormorants, 820 Tree Swallows and 731 Tennessee Warblers, while highest totals for game species were 5658 Mallards, 4757 Blue-winged Teal (not Wood Ducks as listed in Table 4 - correct listing in Table 7) and 2216 Northern Pintails. Besides these data, the report lists totals for all species in each province and territory, ratios of young to adults banded from 1977 to 1980 for several species, and status of birds marked with other than standard bands and/or caught by non-standard methods.- Martin K. McNicholl

ORNITHOLOGISTS URGE PROTECTION OF WATERTON-GLACIER

At the 1982 annual meeting of the American Ornithologists' Union in Chicago, Illinois, a resolution was adopted urging the protection of the Waterton-Glacier International Peace Park, Alberta-Montana. The AOU noted concerns that water and air pollution might damage the ecological system within and around the park as development of the Cabin Creek Coal Mine nearby in B.C. progresses. The mine will be composed of the two largest open pits for coal in the world, and thus have considerable potential for damage to salmonids, their predators (Ospreys, Bald Eagles, Grizzly Bears), the many rare species of plants found in the two parks, and other natural values. The full text of the resolution, which was addressed to B.C. Premier Bill Bennet, U.S. President Reagan, and Prime Minister Trudea, has been published in Auk 100 (2, suppl.): 25AA, 1983. - Martin K. McNicholl

POACHING GUIDE LOSES LICENSE

After a March 17 hearing in Cranbrook, B.C., Harvey Andrusak, regional manager of the Fish and Wildlife Branch, ruled that William Rankins of Wasa, B.C. should forfeit his guide-outfitter's license. Rankins had been convicted of a number of poaching offenses including helping a California millionaire shoot a bighorn ram at the Icefields in Jasper and a bull elk at the Sawback picknic area in Banff National Park. Courts in Alberta and B.C. levied fines totalling $5,000 and jail terms totalling 75 days as a result of the convictions. - Mike McIvor, Bow Valley Naturalists' Newsletter.

ENVIRONMENTAL LAW COURSE

The Environmental Law Centre and the John Janzen Nature Centre will again join forces to present a five-session evening course on environmental law to be held at the Nature Centre on alternate weeks beginning Nov. 8. The course will provide an opportunity for the public to become acquainted with environmental law, legal actions and remedies within the context of topical Alberta issues. For further information contact the Environmental Law Centre, 411-10201 104 St., Edmonton (425-6740). (Environ. Views 6(4), July/Aug. 1983)

CORNELL OFFERS PREDATOR STUDY PRESENTATIONS

A number of programs dealing with predators are being offered, for rent or sale, by Cornell University. Included are slide/scripts on Understanding Predation and Understanding Northeastern Birds of Prey. Both are suitable for presentation to junior/senior high school students, college students and adults, and both are quite reasonable

in cost ($12 rental, $29-30 purchase). For further information contact Cornell Univ. Distribution Center, 7-8 Research Park, Ithaca, New York 14850.

DUCKS UNLIMITED PHOTOGRAPHY AWARD

DU (Canada) Ltd. is sponsoring a wildlife photography award program designed to increase public awareness of wetland conservation issues and to offer Canadian photographers an opportunity to present their work to an audience which appreciates and supports wildlife photography as a distinctive art form. Canadian photographers are invited to submit colour transparencies which depict wetland themes and conforms to one of the following three categories: waterfowl species, marshland wildlife, and marshland values. Contest deadline is Nov. 30, 1983. For further information and entry forms, please contact DU (Canada) Photo Award Program, 1190 Waverley Street, Winnipeg, Man. R3T 2E2.

WILDLIFE FILM FESTIVAL

The University of Montana Chapter of The Wildlife Society will again sponsor the Seventh Annual International Wildlife Film Festival on April 11-15, 1984, at the Missoula campus. The primary purpose of the Festival is to encourage excellence in the making of wildlife films. The deadline for submission of applications and films is March 23, 1984. For further information write: Wildlife Film Festival, Wildlife Biology Program, University of Montana, Missoula, Montana 59812 (406-243-5272).

RARE SPECIES UPDATE

Last year's surveys of the Slave River Rapids white pelican colony produced 87 chicks to flying stage from 95 nests. These surveys mean the world's northernmost white pelican colony has more than doubled in the number of flightless young over 1981, and exploded by four times since the 21 young hatched in 1974, when monitoring first began seriously. The colony is, of course, the only one not protected by Alberta statutes (under the soon-to-be-obsolete Alberta Wildlife Act, which names several other colonies granted specific protection. (Slave River Journal, May 19, 1983, Jacques van Pelt. . . . .The U.S. Fish & Wildlife Service is spearheading a little-publicized effort to increase the Northern Rocky Mountain Gray Wolf population in Idaho, Montana and Wyoming, a project Sen. James McClure says could pit the interest of America's largest canine predator against humans in some mountain areas. Critics charge that officials, in their attempt to protect the species, could prohibit key habitat areas any human activities judged to be in conflict with the wolves' best interests. Establishment of a critical habitat would prohibit much access and use of the area by man, McClure said. There would be no balance. But federal officials working on the project contend that the wolf recovery program will have minimal impact on human activities. The goal of the wolf recovery program is to increase wolf numbers enough to downgrade the species from "endangered" to "threatened". Meanwhile, the State Wildlife Commission unanimously passed a resolution that opposes the reintroduction of either the timber wolf or Grizzly Bear into Colorado. The idea of reintroducing wolves, a species that historically lived in Colorado but was driven out by sportsmen, trappers, the cattle industry and loss of habitat, surfaced when Rocky Mountain National Park biologist Dave Stevens suggested it as a possible solution to the growingelk herds in the park. (Can. Wolf Defenders Newsletter, 1983). . . . . The International Union for Conservation of Nature and Natural Resources (IUCN) has called for a 'significantly reduced quota or a cessation of the annual Canadian hooded seal hunt' due to uncertainties about the current population status of this species (Nat. Can. 12(2): Apr./June 1983) . . . . . .

Two month-old Gyrfalcons from the Yukon were shipped to France on July 21, 1983, for training to fly cover for France's Mirage jets. The birds will be trained to attack Herring Gulls that flock around two strategic air basis in France. They were sold for $1500 each plus $1000 in export permits. The two young gyrfalcons were replaced in the nest by a pair of tundra Peregrine Falcons that had been hatched in captivity. The French government, which sent a special envoy to Whitehorse to pick up the birds, expects to breed the Yukon falcons and bolster its bird defense system next spring. (Edmonton Journal, July 21, 1983) [FAN has sent a letter of protest to the Yukon Territorial Government - Ed.]

BITS N'PIECES

The Banff Centre School of Management will be offering a course about "How to Present Environmental Evidence" beginning October 30. Cost, $1040 including accommodation for the 5-day course. Contact Kelly Potter, Program Coordinator, Banff Centre School of Management, Box 1020, Banff, TOL 0C0. . . . A report released by Environment Canada shows that the amount of mercury discharged from chlor-alkali plants has decreased by 99.8 per cent since 1972, when the regulations under the Fisheries Act were put in place. The lowering of discharges has led to a very significant decrease of mercury concentrations in fish in most of the waterbodies affected by the effluents. (Environ. Canada news release). . . However, mercury levels in some fish from the North Saskatchewan River are unsafe, according to a government study that warns pregnant women not to eat the fish. A report prepared by Alberta Environment Centre at Vegreville showed levels in goldeye, walleye and sauger about .1 ppm higher than the Health and Welfare safe limit of .5 ppm. . .The Federal Environmental Protection Service is coordinating a program which starts this summer to study the effects the Norman Wells Oilfield Expansion and Pipeline Project will have on the environment. The five-year program is designed to measure the overall impacts on wildlife, fish, water, air and vegetation. (Norman Wells Project Review Information Pipeline, May 1983). . . The Reagan administration *finally* concluded that "acid rain is caused mainly by man - and that man should do more to stop it." (U.S. News & World Rep., June 20/83). . . The revised edition of The Bird Finder's 3-Year Note Book is now available. Order from Paul S. Eriksson, publisher, Battell Bldg., Middlebury, Vt. 05753, $9.95. . . . Canada's largest national park, Wood Buffalo, on the Northwest Territories/Alberta border, has been proposed as a 1983 candidate for the World Heritage List. The park contains rare and superlative natural phenomena such as the Peace-Athabasca Delta, perhaps the world's largest inland delta, and protects habitat where populations of rare or endangered species still survive, including Whooping Cranes and Peregrine Falcons. (Parkscan, 4(1): March/April 1983).

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